

**Report of an Independent Audit of Forest  
Management on the Mazinaw-Lanark Forest  
for the Period 2004 to 2009**

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## **1.0 Executive Summary**

A team of five auditors carried out an independent audit of forest management on the Mazinaw-Lanark Forest (MLF) covering the period from April 1, 2004 to March 31, 2009. The MLF was created in 2002 with the signing of Sustainable Forest License (SFL) #542621.

The MLF has been managed through this period by Mazinaw-Lanark Forest Inc. (MLFI), under the auspices of two, sequential 20-year forest management plans (commencing April 1, 1999 and the second starting on April 1, 2006) with the Ontario Ministry of Natural Resources (OMNR). The audit examined the compliance of MLFI with the terms and conditions of the SFL agreement and reviewed the OMNR's performance in meeting its obligations on the MLF. The audit included an extensive review of the plans and records of forest management activities, along with field verification visits to areas where a variety of forest management activities occurred during the audit period. Public input was solicited through a public mailing, newspaper advertising, and mail-in surveys.

This audit report identifies 15 recommendations aimed at improving the management and administration of the MLF.

The audit has two recommendations aimed at improving the participation of aboriginal communities in the economic opportunities generated by activities on the MLF. There has been an increase in interest among aboriginal communities in the area, and there is active participation on the planning team for the next forest management plan (FMP).

The identification and management of non-timber values was the subject of three recommendations. It has been recommended that OMNR, corporately, provide funding to complete surveys of these values in a more timely manner. The company and OMNR are to evaluate the current practice of identifying endangered species values on maps. One endangered species on this forest has commercial value, and the current practice of values identification may, as an unintended consequence, make the location of this endangered crop known to those with an interest in illegal harvest. Bridge inspections should be conducted by OMNR to ensure that they suitably protect the aquatic habitat they traverse and ensure public safety.

Mazinaw-Lanark Forest Inc. has been asked to review its harvest allocation process where stands are assigned to individual companies within the MLFI shareholder group. The current practice allows individual operators to have several individual stands open and operational at the same time. In the auditor's opinion, this led to an unnecessarily inefficient administrative process as well as the potential to compromise the cost or effectiveness of post harvest silvicultural operations. The audit also recommends that

MLFI improve the training program for operators, by having discussions with operators prior to the start of operations on each block.

The auditors were impressed with the intensive effort that MLFI has made in trying to renew red oak on this forest. Unfortunately, the success rate of this effort is not high. It may well be that part of the problem is that the renewal target for red oak, driven by a requirement to operate within the parameters of the Madawaska Highlands Land Use Plan, is simply too high. This has led to a recommendation that the red oak regeneration target be reassessed.

The audit team also recommended that OMNR review the application of the Natural Disturbance Pattern Emulation Guide (NDPEG). This guide has been designed for application in large block forestry that is typical in Ontario's boreal forest. Its application in the complex, small block ecosystem of the MLF makes little sense.

Further, the auditors recommended that MLFI consider additional use of herbicides to help meet regeneration targets on high risk and high investment sites.

Two recommendations were made regarding the compliance program on the MLF. First, MLFI should stop the practice of having authors of compliance reports also approving them. While this is practical in a small office where issues are commonly identified verbally and quickly, in the view of the audit team, it is a conflicted practice.

Secondly, the OMNR should move with more diligence to address non-compliant performance on harvest operations. This is a recommendation that is effectively repeated from the last audit, and reflects a situation where one operator has incurred several non-compliances.

The Mazinaw-Lanark Forest is one of the most ecologically complex forests in Ontario, and the audit team applauds the commitment that both OMNR district staff and MLFI staff have demonstrated to this landbase. Operational prescriptions are very detailed and applied on a spatial scale that is uncommonly precise. Staff have done an excellent job of identifying and applying protective prescriptions to nests and other wildlife habitat. The silviculture is as challenging as any in the province.

The forest operates inside an area that is well accessed and heavily used in both winter and summer for recreational purposes. The forest managers have done an excellent job of operating in step with the recreational community. The Local Citizens' Committee (LCC) is well managed, and serves as a very effective vehicle for reaching out to other interested stakeholders.

Finally, the shareholders that make up the MLFI are a uniquely entrepreneurial group of small and medium enterprises that aggressively market the variety of timber harvested from this forest. In a forest that has operational constraints (such as small blocks,

difficult terrain, and complex harvest prescriptions) that would be a detriment in many other jurisdictions, this group is operating with apparent profit and obvious effectiveness.

The audit confirms that this is a well-managed forest. Technical aspects of forest management are completed in a satisfactory manner. Communication between the various stakeholders on the forest is very strong and relations are professional, positive, and progressive. Mazinaw-Lanark Forest Inc. is satisfactorily meeting the terms and conditions of the SFL. Ontario Ministry of Natural Resources is also meeting its overall responsibilities associated with its role in managing this forest. The audit team confirms that, based on the evidence reviewed, management of the MLF was in compliance with the legislation, policy, and regulations that were in effect during the 2004-2009 audit term. The MLF is being managed sustainably. The audit team has recommended that the term of the SFL be extended for an additional five years.

## **2.0 Table of Recommendations**

### **Recommendation on License Extension**

The audit team concludes that management of the MLF was generally in compliance with the legislation, regulations, and policies that were in effect during the term covered by the audit, and the MLF was managed in compliance with the terms and conditions of the SFL held by MLFI. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol. The audit team recommends that the Minister extend the term of SFL #542621 for a further five years.

### **Recommendations to MLFI and the OMNR Districts**

1 - OMNR and MLFI shall meet regularly (minimum once a year) with the Algonquin communities to discuss opportunities for more economic benefits on the MLF.

2 - OMNR, with the participation of MLFI, shall implement the Condition 34 Toolkit on the MLF to assist in documenting current involvement in the forest sector economy as well as defining future objectives and associated strategies.

4 - OMNR should inspect bridges that have been assigned as their responsibility and ensure all environmental requirements are met.

5 - MLFI, with the assistance of district OMNR staff, should review their operations manual requirements to ensure that information about sensitive values is provided only to those required to know for implementation purposes.

6 - OMNR needs to reexamine, with MLFI, the prescriptions for sensitive values and evaluate alternative prescriptions (which may still be under development) that will comply with the intent of the Endangered Species Act. This should include consideration of the risk to conservation of the sensitive values that occurs through planning procedures that may inadvertently make sites known.

8 - MLFI shall enter into discussions with MFMC for the purpose of considering refinements to the harvest allocation process that will promote greater efficiency and minimize apportioning single harvest blocks into smaller parcels.

10 - District OMNR should petition the authors of the Madawaska Highlands Land Use Plan to establish a more realistic red oak renewal objective.

11 - MLFI shall examine if there are additional opportunities for chemical tending to

increase the effectiveness of regenerating high risk and high investment areas.

12 - MLFI must verify that operators have staff that are aware of the requirements of the operations manual prior to the start of operations on each block.

13 - MLFI shall amend its 2006-2011 Compliance Plan Strategy to indicate that the General Manager shall be responsible for reviewing and approving all compliance monitoring reports filed by company compliance inspectors.

14 - OMNR Bancroft shall utilize the full remedial provisions of the Forest Compliance Handbook, including the suspension and/or cancellation of harvest licenses, or consider applying other innovative remedies where orders and/or monetary penalties are not resulting in corrective actions from operators with consistently poor compliance records. OMNR and MLFI shall ensure all licensees are aware of their obligations to supervise operations and ensure that all operators are provided with the most up-to-date maps and information. Mazinaw-Lanark Forest Inc. shall also utilize the provisions available under the Unanimous Shareholders Agreement to induce better compliance performance.

15 – MLFI shall ensure that adequate resources are available to more closely align the level of silviculture assessment monitoring to the level projected in the approved FMP.

#### **Recommendations to Corporate and Regional OMNR**

3 - Corporate OMNR must ensure that funding for biological values surveys arrives for use in forest management planning in a timely manner.

7 - Corporate and district OMNR should work with MLFI on: the implementation of the ESA, seeking practical operational approaches to the protection and recovery of the endangered species; clarifying to the company how and when the ESA flexibility tool can be used; and, how the company can make their operations comply with the ESA through the FMP, as an instrument of the ESA.

9 - Corporate OMNR shall review the prerequisites for implementing clearcutting in the Great Lakes-St. Lawrence Forest Region with the goal of reducing documentation and analysis requirements, particularly in situations where clearcut sizes are less than an established threshold. Consideration should be given to eliminating onerous documentation requirements for clearcuts that are smaller than the minimum threshold.

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### **3.0 Introduction**

#### **3.1 Audit Process**

An independent forest audit of the Mazinaw-Lanark Forest (MLF) was undertaken in September, 2009. The objective of the audit was to assess the performance of forest management activities conducted during the five years from April 1, 2004 to March 31, 2009, as measured against the plans, guidelines, regulations, and legislation in force during that period. The audit was conducted in compliance with the *Crown Forest Sustainability Act* (CFSAct) (Statutes of Ontario 1994) and fulfills the requirements of the *Class Environmental Assessment Approval for Forest Management on Crown Lands in Ontario* (Ontario Ministry of Environment and Energy 2003). The audit assessed the effectiveness of forest management activities in achieving the management objectives for the MLF. The audit examined the compliance of Mazinaw-Lanark Forest Inc. (MLFI) with the terms and conditions of its sustainable forest license (SFL) #542621 for the MLF and also reviewed the performance of Ontario Ministry of Natural Resources (OMNR) in meeting its obligations on the MLF.

The audit was conducted in accordance with the Independent Forest Audit Process and Protocol (OMNR 2008) by a team of five independent auditors, consisting of three registered professional foresters (RPF), a biologist/ecologist, and a socio-economist. A list of their qualifications is presented in Appendix 6.

The auditors collected evidence through document review, interviews with staff and stakeholders, and physical inspection of field activities that occurred on the MLF between April 1, 2004 and March 31, 2009. Field site visit locations were selected to evaluate harvest, renewal, tending/maintenance, free-to-grow (FTG) operations, areas of concern (AOC), road construction and maintenance, site preparation, water crossings, wildlife management activities, and other areas of special interest. Additional detail on the audit process and sampling are provided in Appendix 4.

This report summarizes the findings of the audit and presents recommendations and suggestions.

#### **3.2 Management Unit Description**

The MLF is located in southeastern Ontario in the Great Lakes-St. Lawrence Forest Region at the edge of the Canadian Shield. It is the southernmost Crown management unit situated within the geographic boundaries of OMNR's Bancroft, Peterborough, and Kemptville Districts. The MLF was created in April 2001, when the former separate

Mazinaw and Lanark Crown Management Units were amalgamated to become the Mazinaw-Lanark Forest Management Unit (Figure 1).

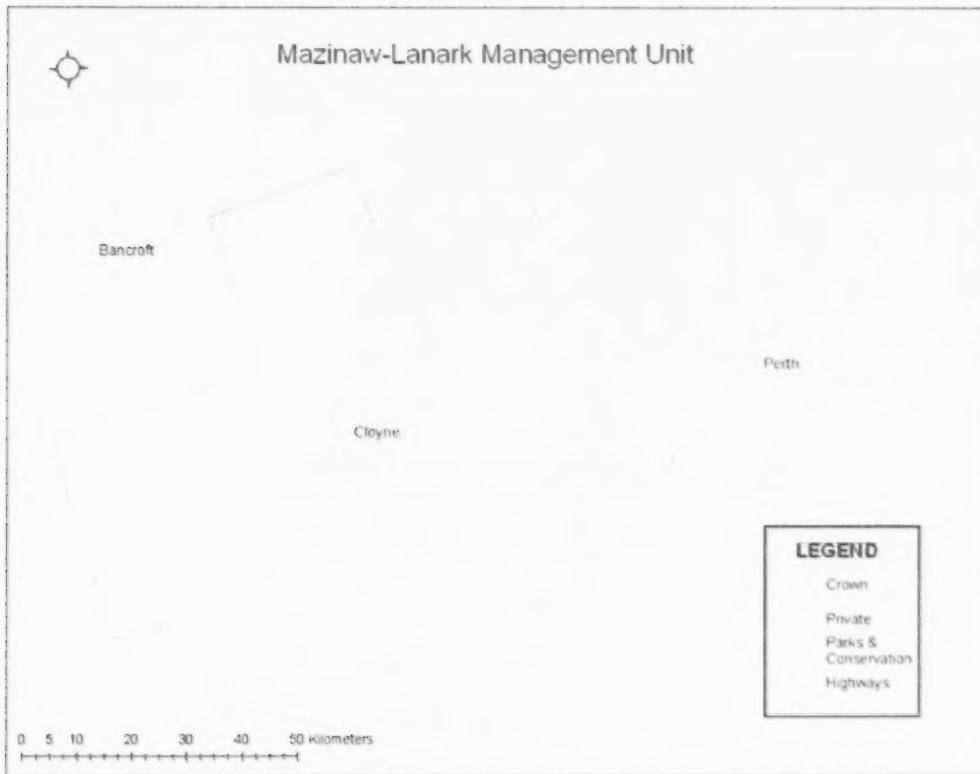


Figure 1. Map of the Mazinaw-Lanark Forest.

Though the forest falls within parts of three OMNR districts, Bancroft District takes the lead in dealing with the licensee (MLFI). Mazinaw-Lanark Forest Inc. is a private company owned and funded by local forest products companies. The shareholders include seven sawmills, a pulp mill, and a group of twelve independent logging companies. The company's office is located in Cloyne, Ontario.

Crown land makes up 28% of the MLF landbase. The remainder is patent land (67%), parks, and other lands. Relatively small parcels of productive Crown forest are interspersed with private land holdings, making the area socially complex. Road access is well established through most of the forest.

The forest itself is also silviculturally complex. Rich soils support 17 commercially-viable tree species, dominated by hardwood and mixed hardwood stands. A breakdown, by area, of the principle tree species on the forest is shown in Table 1.

**Table 1. Landbase summary for managed Crown lands on the Mazinaw-Lanark Forest (2004-2009).**

Land class	Area (ha)	
Non-forested		
	Other land	2,419
Forested		
	Non-productive	29,100
	Protection	2,591
	Productive	189,798
	B&S	2,777
	NSR/Depleted/	1,172
	White pine	32,374
	Red pine	2,314
	Jack pine	42
	Spruce	698
	Balsam	7,249
	Yellow Birch	53
	Cedar/Larch	5,769
	Hemlock	5,277
	Poplar	17,571
	Mixed hardwood	45,546
	Hardwood	63,521
Total production forest		187,208
Total forested land		218,897

The MLF is one of three forests in Ontario that are situated on the band of calcareous rock next to, and intermingling with, the granite of the Canadian Shield. This location creates a unique soil condition that fosters rare plant species and other sensitive values.

### 3.3 Current Issues

High priority issues for the MLF were identified by reviewing the most recent 2006-2026 forest management plan (FMP), the results of the public consultation process conducted as part of the audits, and discussions with auditees at the pre audit-meeting.

These issues are as follows:

**Fragmented forest ownership:** More than 40% of the total area within the MLF boundary is private land. This poses challenges for landscape management and management of small landlocked parcels of Crown land. Boundary maintenance on harvest blocks and shared use of forest roads with forest users were examined.

**Small average block size/complex silviculture:** The forest has an average operational block size of 6 ha, up to 17 commercially viable tree species, and 12 forest units that require silvicultural attention. This combination makes this forest one of the most complex to manage in Ontario. The operational prescriptions are very detailed and applied on relatively small scales.

**Compliance monitoring program:** The compliance program was assessed to confirm its effectiveness at monitoring operational performance. Sites with compliance issues were specifically reviewed to determine whether improvements have been made to this critical program.

**First Nations consultation:** There are eight First Nations communities in the vicinity of the MLF. The auditors placed a high priority on consulting with First Nations and assessing progress on Condition 34 of the Class Environmental Assessment. Additionally, there was a comprehensive land claim in process at the time of the audit.

**Administrative complexity:** The MLF lies within the boundaries of three OMNR districts, increasing the complexity of the administrative oversight function of the OMNR. In addition, the forest has a relatively high number of licensees (all who are part owners of MLFI), which adds to the potential complexity of the administrative processes.

**Technical application of provincial guidance documents:** Provincial guidelines apply poorly to the small block, highly diverse ecology found on the MLF. The application to this forest of operating guidelines designed for large block forestry creates ineffective and inefficient operating rules.

**Common use of roads:** The forest is very well accessed and roads that lead to operational blocks are commonly shared by cottagers and other residents.

**Fiber market is different and, in some ways, better than for the rest of Ontario:** The diverse species mix and the large number of operators on this forest have created a unique logger-driven market. It is demonstrably more dynamic than most other forests in Ontario.

**Madawaska Highlands Land Use Plan:** The northeastern part of the MLF operates under the higher level planning requirements defined in this land use plan. This situation potentially reduces operational flexibility and has, at least partially, created a target for red oak regeneration that is higher than justified by the historic forest condition. Red

oak regeneration is a significant challenge for MLFI. The land use plan requires access constraints that are not common to the rest of the forest.

### **3.4 Summary of Consultation and Input to the Audit**

The auditors distributed 800 surveys, held two open houses, and placed advertisements inviting comment in one major daily newspaper and 14 regional papers. Members of the Local Citizens' Committee (LCC) were interviewed, as were members from each of the First Nations communities with an expressed interest in the MLF. A more detailed summary can be found in Appendix 4.

## **4.0 Audit Findings**

This section provides a summary of audit findings for each principle. Detailed discussions for each recommendation are found in Appendix 1.

### **4.1 Commitment**

The independent forest audit protocol requires both the SFL holder and OMNR to have policy statements and operational performance that demonstrate the commitment of the organization to sustainable forest management.

The audit identified that both organizations have clear policies that identify a commitment to the sustainable management of the MLF. These documents are available for view by employees, stakeholders, and interested members of the public.

### **4.2 Public Consultation and Aboriginal Involvement**

The LCC in place during the audit period was comprised of a diverse mix of individuals, including representatives from environmental/naturalist organizations, the forest products industry, loggers, the general public, First Nations, anglers and hunters, prospectors, and tourism interests.

The LCC supported the 2006 FMP but noted that the bureaucratic process was sometimes frustrating. Overall, the LCC members spoke highly of the co-operation provided by MLFI and the OMNR LCC liaison from Kemptville District.

Numerous public issues arose during the planning process regarding the impact of forest operations, specifically viewscape and visibility, access control, and the location of roads and landings adjacent to Otter Lake. All but one of these issues were resolved without having to invoke the issue resolution process. The issue resolution process was invoked by the Lake Weslemekoon Cottagers' Association and individual cottagers located on

Otter Lake and Weslemekoon Lake but a consensus was eventually reached by OMNR, the cottagers' association, and MLFI.

The auditors made efforts to consult with four Ontario Algonquin Nations and the Mohawks of the Bay of Quinte.

Discussions with representatives of the two First Nations (Algonquins of Pikwakanagan and the Mohawks of the Bay of Quinte) identified that the MLF is not of interest to their communities. In a review of documentation, it was evident that the OMNR made efforts to consult with both First Nations and that no reciprocal interest was provided.

Meetings were held with several representatives from three Algonquin communities during the audit: the Algonquin Nation of Kijicho-Manito (or Bancroft Algonquins); Sharbot Obaadjiwan First Nation (generally situated in the Sharbot Lake area); and, Snimikobi (Beaver Creek) Algonquin First Nation. The communities of Snimikobi and Sharbot Obaadjiwan indicated that the MLF is of primary importance to them, mostly because of its location. It is important to note that Algonquin communities have indicated a stronger interest in the MLF in the forthcoming forest management plan.

All three Algonquin communities were offered consultation opportunities during the planning process. One member of the Sharbot Obaadjiwan sat on the planning team for the 2006 FMP and another participated in the LCC.

Native background information reports were prepared for all three communities and some values collection has occurred on the forest. It is clear that the various communities have values across a number of forests within the Algonquin claim area, an area including most of Algonquin Park, the Ottawa Valley Forest, and the northern part of the MLF. Recently, OMNR was able to change the administrative rules to allow the values collection exercise to be completed over the traditional territory rather than in a more piecemeal, forest-by-forest basis. They are to be commended for taking this approach. It would be advantageous if values collection funds could be pooled across forests and across communities to engage in a more comprehensive values collection exercise.

Based on the evidence available it appears that aboriginal communities and peoples receive little economic benefit from the MLF. Details of the few projects undertaken are provided in Appendix 1 as background for Recommendation 1.

The intention of Condition 34 of the Class Environmental Assessment is to achieve more equal participation by aboriginal peoples in benefits provided through forest management. It is clear that there have been projects initiated (one tree plant contract and 5 tree marking contracts). However, there is insufficient evidence that the effort is being maintained or that communication on the part of OMNR, MLFI and First Nations

has been sufficient to support further progress. The intention of Condition 34 has not been achieved on the MLF.

Aboriginal involvement in the MLF has been, and will continue to be, dynamic as a result of the identification and evolution of Algonquin interests and communities and the Algonquin land claim. Two of the three Algonquin communities that were identified during the term of the audit were only recognized towards the end of the most recent FMP. Consequently, the economic interests of the Algonquin communities are likely to continue to evolve but economic aspirations must face the reality of very challenging economic times in the forest industry.

The Algonquin communities with an interest in the MLF have expanded since 2006 but most of the community leaders have little or no knowledge of the MLFI. It is hard to make progress on economic opportunities when the key parties are unknown to each other. A recommendation has been made to improve communications in this respect (Recommendation 1).

It is not clear to Algonquin communities why they do not receive economic benefits from the MLF. The parts of the annual reports addressing Condition 34 of the Class Environmental Assessment do not provide any indication as to why opportunities are not being created. The OMNR has established the Condition 34 Toolkit, which is intended for use by OMNR staff and individual First Nations to document current involvement in the forest sector economy as well as future objectives and associated strategies. It is possible, based on discussions with First Nations representatives, that there may be opportunities to expand involvement for non timber management activities, such as species at risk habitat identification and protection.

As many of the Algonquin communities with an interest in the MLF have only recently been identified, the Condition 34 Toolkit would be an appropriate way to begin dialogue on economic opportunities. Given the lack of identified economic benefits accruing to Aboriginal peoples and the limited dialogue that has occurred, it is recommended that the Condition 34 Toolkit be utilized (Recommendation 2).

#### 4.3 Forest Management Planning

The development of the 2006 FMP for the MLF was a significant effort for both the OMNR and MLFI. The challenge of interpreting the 1996 Forest Management Planning Manual (FMPM) and then applying those interpretations within Ontario's prescribed planning schedule was evident. The plan was approved and is currently being implemented. All members of the planning team should be congratulated on their efforts.

Inventory was a challenge for the planning team. Mazinaw has a new (2004) Forest Resource Inventory (FRI), while the Lanark portion had an updated 1991 inventory. The

difficult process of combining the new and older inventories took some time. Extensive effort was expended verifying and correcting the Production Forest Reserve area. Much of this area was shifted to Protection Forest and no longer contributed to the available harvest area.

The FMP defined 13 management objectives. Quantified targets have been defined for less than half of the objectives. The remaining objectives have either qualitative targets or no targets. For example, the tourism, cultural heritage, native resources, genetic diversity, and wetland quality objectives had either qualitative or no targets presented.

In the 2004 independent forest audit, there were recommendations related to the incorporation of non-timber values information into the 2006 FMP. Values maps for the current plan were up to date for the time of the planning exercise. With the assistance of the SFL and other support staff, OMNR created a process for ensuring timely updating of values.

There were questions raised by the public regarding the appropriateness of some of the prescriptions including the type of harvest adjacent to moose aquatic feeding areas, the size of buffers adjacent to water bodies, and other issues related to harvest near water. Upcoming modifications to the *Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales* (Stand and Site Guide) should address some of these concerns.

The audit team reviewed the status of stream survey information, which was the subject of a recommendation in the last audit. Kemptville District has made efforts to provide updated thermal classifications. However, OMNR has not corporately addressed this issue, since funding would be required. The very low level of information about streams in most districts has been a constraint on the forest industry because of the need for inventory information to harvest in some areas.

The release of the Stand and Site Guide will modify the need for stream inventory information and it will change the AOC prescriptions. Consequently, the audit team opted not to include a recommendation about these issues in this audit.

There were delays in funding for values surveys such as moose aquatic feeding areas. Surveys are planned well in advance, and the district has applied for funding in a timely manner. Corporately, OMNR needs to ensure that the money is deployed in a way that meets the biological need rather than the fiscal one. A recommendation has been made in this regard (Recommendation 3).

No resource stewardship agreements have been signed, although efforts were made for their development.

#### 4.4 Plan Assessment and Implementation

The audit team assessed the appropriateness of the 2006 FMP in describing field conditions (including locations of values and other resources), if field implementation reflects the direction and assumptions in the FMP, and if the areas where actual operations were undertaken reflect the eligibility and selection criteria listed in the plan.

Overall, the auditors were satisfied that the SFL landbase conditions that were encountered in the field were closely reflected in the descriptions in the FMP. The MLF straddles two site regions. Ecosite designations were generated for each forest stand via a computer algorithm developed by OMNR's Southern Region which confirmed that all but one of the 25 forest ecosites found in central Ontario are present on the forest. This diversity is the principle contributor to the relatively small stand sizes in the FRI.

The stand diversity presents planning and operational opportunities as well as challenges. One of the most significant challenges is encountered during pre-harvest inspections, where preliminary stand prescriptions are commonly modified to accommodate actual conditions found in the field.

The auditors examined 66 AOCs on the ground including: 25 aquatic sites (Cold Water fisheries, Warm Water fisheries, or Wetlands); 8 AOC crossing installations; 12 nest sites; 3 tourism areas; 11 special values (deer yards, cultural, other); and 7 access-related prescriptions (gates, roads, trails). In addition, the auditors reviewed the compliance files for a large number of AOCs, including those that were inspected during field visits.

Implementation of AOCs requiring buffers, such as nests and aquatic areas, was well done. Buffers tended to be larger than the prescription required which, when carried out repeatedly, can cause a loss of wood without any added protection to values. Two locations were observed where this was the case, but they were not judged to be significant. There were no instances where buffers were too small.

Eight water crossings were inspected, including one permanent crossing which was the responsibility of OMNR. Open decking, no corner signs, and no road signs were issues that were found. Although these matters are relatively small, the MLF is in an area where public access is common, and operators have been criticized for their installations. Consequently, government bridges must set an example (Recommendation 4).

The Bancroft District Information Management Landscape Values Reporting process effectively ensures timely updating of values on the MLF. The auditors noted a number of sites where the plan maps differed from the operational maps because new values were found. This indicates that there is an effective process for updating values maps. In this forest, this is particularly onerous for nest sites, which resulted in changes for

almost every block visited on the audit. The auditors feel that OMNR and the operators have effectively addressed the challenge of values identification.

Gates are an issue on the MLF because of the Madawaska Highlands Land Use Plan, which is a higher level plan implemented by the FMP. Most gates were closed and properly maintained. However, in two situations evidence was found showing that all-terrain vehicles (ATV) were circumventing gates through streams. There was a general concern by the managers and stakeholders about uncontrolled and inappropriate ATV use. Ontario Ministry of Natural Resources and MLFI should continue to build relationships with ATV groups to help educate users about the potential environmental damage they may cause.

The auditors reviewed the appropriateness of AOC prescriptions. There were no concerns about conventional prescriptions. However, the auditors were concerned about how some sensitive values are addressed, particularly those that involved the Endangered Species Act (ESA).

The audit team received a number of comments that the public nature of planning is drawing attention to sensitive values. This challenges the merit of identifying the ESA sites for protection purposes. The auditors commend all involved for putting sensitive values at the highest priority, and some immediate adjustments can be made to minimize the risks (Recommendation 5).

The audit team felt operational confidentiality, consideration of alternative prescriptions that meet the intent of the ESA, and consideration of the FMP as an instrument of the ESA, needed additional review.

The ESA contains provisions for instruments and permits that do not seem to have become part of the discussion with MLFI as yet. The audit team believes that OMNR will need to help MLFI explore alternative approaches to full compliance with the ESA, while ensuring that necessary constraints are as practical as possible to allow company operations to continue. A recommendation is made to this effect (Recommendation 6).

There were more than 100 plan amendments to the 2001 FMP, largely due to AOC changes. The process has been corrected by OMNR and this type of amendment is now infrequent. There have been 25 amendments to the 2006 FMP. The bulk of these have been changes to allocations on the west side of the forest. The current arrangements with the licensees allow them to open multiple blocks at once which leads to multiple changes to licenses. This process can cause operational, silvicultural, and utilization issues. For example, the period of road maintenance may be extended or renewal efforts are delayed. There were at least two examples noted by the audit team where harvested wood was left behind. The auditors are aware that operators achieve a level of flexibility in harvesting to suit market conditions with this process but the administrative burden is excessive.

There was considerable discussion about the lack of direction that had occurred up until the field audit for working near endangered species. The current situation warranted a recommendation to encourage corporate OMNR to work with the MLFI and district staff, who have serious and fair concerns about the implementation of the ESA more than two years after becoming law (Recommendation 7).

Numerous harvesting operations on a variety of sites and conditions were inspected by the audit team. All timber harvesting on the MLF was implemented by 19 overlapping licensees, all of whom are directly, or indirectly, shareholders of MLFI.

A total of 5,892 ha were harvested on the MLF, which represents 63% of the planned harvest area of 9,414 ha. Wood harvested from this area totaled 400,949 m<sup>3</sup>, or 68% of the total planned volume. Overall, the shortfalls in harvest target achievement reflect very poor market conditions.

The distribution of harvest area among the shareholders is based on the provisions of the Unanimous Shareholder Agreement for MLFI. Harvest allocations may be partitioned further among the licensees through internal discussions. This has been the case with shareholders in Mazinaw Forest Management Corporation (MFMC).

This process sometimes leads to single harvest blocks being partitioned among two or more licensees, which can result in administrative and logistical headaches for both the company and OMNR on several levels (e.g., licensing, compliance monitoring, and subsequent silviculture work). The auditors recommend that MLFI and MFMC develop an alternative harvest allocation model that discourages the further division of single harvest blocks into smaller, more numerous blocks (Recommendation 8).

The silviculture systems utilized on the MLF are predominantly the shelterwood and selection systems, which employ partial cutting methods and rely on natural regeneration. According to the planned harvest for 2006-2011, 45.4% will be managed under the selection system, 38.1% under the shelterwood system, and 16.5% under the clearcut system.

Tree marking is a critical aspect of implementing the partial cutting systems. All marking is carried out prior to harvest. Tree markers are required to submit reports to MLFI upon the completion of their assigned blocks. Nearly all tree marking is audited by MLFI staff, and may occasionally be conducted along with OMNR staff. In the end, practically every hectare of forest designated for harvest is walked at least once before it is harvested.

Observations at most harvest locations visited by the audit team confirmed that utilization and harvesting practices were generally good to excellent. The auditors observed some merchantable timber left on site, high stumps in areas harvested during

the winter season, and trees marked for harvesting that were not felled. Logging damage to residual trees, to regeneration, and skid trail coverage was minimal on nearly all sites visited.

Harvest operations were broadly consistent with the forest operations prescriptions and were appropriate for the specific site conditions, species, and stand structures that were encountered. The prescriptions are very comprehensive, yet provide sufficient flexibility in the event that stand conditions are not harmonious with the preferred prescription.

The application of the *Forest Management Guidelines for Natural Disturbance Pattern Emulation* (NDPEG) on the landscape appears to be inappropriate where continuous forest cover dominates. The auditors witnessed situations where application of NDPEG resulted in no apparent improvement in the ecological outcome of the harvest operations. The audit team is aware that the approach to NDPEG is under review as part of the expected implementation of the Stand and Site Guide however, the auditors are not privy to the specific direction provided in this document. Pending effective implementation of the new guidance, the auditors have recommended that OMNR consider reviewing the applicability of NDPEG on the MLF (Recommendation 9).

The renewal program on the MLF relies heavily on natural regeneration (83% of the total program). The selection system was applied to about 41% of the harvest area. The shelterwood system was practiced on about 46% of the area harvested on the MLF during the audit term. Shade intolerant species, such as poplar and white birch, are managed under the clearcut system and this was applied to 13% of the area harvested.

Red oak renewal is a challenge on the MLF. Renewal results are inconsistent but both failures and successes were difficult to rationalize. There is a social expectation (incorporated as an objective in the 2006 FMP that reflects the expectation found in the Madawaska Highlands Land Use Plan) to maintain the quantity of oak on the MLF landscape at levels that are not consistent with historic levels. The auditors recommend that OMNR districts petition the authors of the Madawaska Highlands Land Use Plan to establish a more realistic red oak renewal objective (Recommendation 10).

In general, the audit team witnessed an effective tending program. The silvicultural ground rules allow for the use of herbicides as a tending treatment, although it has been a longstanding practice on the MLF not to aerially apply herbicides due to the proximity of private land and seasonal constraint on herbicide use. The audit team is of the opinion that there may be additional opportunities for applying cost-effective, chemical tending treatments (Recommendation 11).

#### 4.5 System Support

The system support portion of the audit evaluated the level of training and awareness of staff for both OMNR and MLFI, as well as document management and control for both

groups. Although the document management systems are very different for each party, both were effective.

Company and OMNR staff have personnel records and actively seek training opportunities. These were found to be in order for both OMNR and MLFI.

The training of the large number of independent operators was less complete. The auditors are concerned that MLFI is not able to "ensure current general knowledge as well as knowledge specific to an individual's responsibilities in the sustainable forest management (SFM) system" for all personnel operating on the forest. On this basis, the auditors felt the company needs to verify, prior to the start of operations on each block, that the operator's staff are aware of the requirements of the operations manual (Recommendation 12).

#### 4.6 Monitoring

Ontario Ministry of Natural Resources districts are responsible for preparing Annual Compliance Operations Plans that are consistent with the priorities and objectives in the Regional Resource Management Plans, including an annual implementation schedule that lists compliance monitoring targets for each program administered by OMNR.

The five-year compliance plan prepared by the MLFI met all of the requirements outlined under the applicable Forest Information Manual and OMNR's *Guideline for Forest Industry Compliance Planning, 1998*. The auditors were concerned with the signing-off responsibilities for inspections by the company. Currently, the compliance inspector has the authority to sign-off on his/her own inspection, and the General Manager has the authority to sign-off on reports of non-compliance. These signing-off arrangements are unusual and not consistent with recommended practices. A recommendation has been made to address this situation (Recommendation 13).

The 2004 Independent Forest Audit noted that two licensees were responsible for 80% of the occurrences of non-compliance. In response to the recommendations from that audit, MLFI and OMNR have worked diligently to encourage the problematic overlapping licensees to raise their compliance performance through training, education, and support. The auditors noted the record of one particular licensee whose compliance performance, although improving mildly, continues to be substandard. Consequently, the auditors are reissuing a recommendation similar to one from the previous Independent Forest Audit (Recommendation 14).

The effectiveness of MLFI's compliance monitoring program, and its commitment to continual improvement and prevention of non-compliances, is reflected in its improving compliance record. Focused efforts must continue to improve the performance of specific licensees.

Mazinaw-Lanark Forest Inc.'s program for monitoring silviculture effectiveness has been described in both the 2001 and 2006 FMP. Timing of post harvest surveys depend on the silvicultural system being applied and the stage of management. These assessments serve to determine if the applied silviculture treatment is meeting expectations or if remedial action or additional treatments are required.

The 2004 Independent Forest Audit indicates that the shortfall in regeneration assessments has been an ongoing shortcoming on the MLF. The auditors acknowledge that the rate of annual achievement and assessment effort has increased in recent years, and hope that this trend continues. However, the assessment rates are not keeping pace with the level of harvest. The auditors support the recommendation made in the Year Ten Annual Report and believe that this longstanding issue should be addressed (Recommendation 15).

Bancroft District of OMNR conducted assessments in 2008 on the areas declared FTG by MLFI. A report of the audit findings was prepared combining the results from assessments completed on the two SFLs situated in Bancroft District. Ontario Ministry of Natural Resources has just recently shared their report with MLFI and should continue to do so in the future.

The company has completed its annual reports and Year Ten Annual Report in accordance with requirements. Several annual reports were submitted past the submission deadline, but performance in this area has improved. It is suggested that the company continue to manage its annual report submission deadlines more aggressively.

Roads and water crossings on the MLF are monitored through regular compliance monitoring programs by MLFI and OMNR. The existing access infrastructure is monitored on an "as encountered" basis – there is no systematic inspection process in place, for example, to inspect older crossings at established intervals. The auditors are satisfied that adequate procedures are in place to respond to water crossing and road failures or emergencies. However, OMNR and MLFI should give some consideration to establishing a program of regular inspections of the road infrastructure to minimize potential situations that could lead to harmful alteration, disruption, or destruction of fish habitat or pose a threat to public safety.

#### **4.7 Achievement of Management Objectives and Sustainability**

Forest sustainability is the overriding goal of the CFSA. The success of forest management activities in meeting that goal has been assessed in terms of meeting the objectives they were designed to achieve. By reviewing planning commitments as detailed in the 2001 and 2006 FMPs against achievements and analysis as reported in the Year Ten Annual Report, the Comparison and Trend Analysis of Planned vs. Actual

operations on the Lanark Management Unit and Mazinaw-Lanark Forest (Appendix 7) and observations during this audit, the auditors can assess sustainability on the MLF.

Management objectives have been included in both the 2001 FMP and the 2006 FMP for forest diversity, social and economic values, values dependent on forest cover, and silviculture. A more detailed look at these objectives and the audit team's assessment of how well they have been met is included in Appendix 2.

#### **Forest Diversity**

The forest diversity objective includes specific subobjectives targeting landscape diversity, stand level diversity, genetic diversity, old growth, and wetlands.

The landscape-level diversity objectives have been largely met, including targets for most commercial species (white and red pine, tolerant hardwood, hemlock, cedar, spruce and intolerants).

The target in the 2001 FMP to maintain 15,000 ha for red oak has not been met. As noted in the discussion supporting Recommendation 10, the audit team views the red oak target as unnecessarily ambitious. The target, set in part due to the Madawaska Highlands Land Use Plan, is not consistent with the historic forest condition noted in the FMP. The auditors regard the change in target in the 2006 FMP as appropriate, and support a review of that target to ensure it is more consistent with historic forest conditions.

Stand level diversity targets have been accomplished through stand level silviculture, which, where required, has preferred or protected particular tree species, and the application of AOC prescriptions.

Genetic and old growth objectives from the 2001 FMP have been met. The old growth objective has been expanded in the 2006 FMP.

Wetlands objectives have been met by implementing AOC prescriptions.

#### **Social and Economic Objectives**

Social and economic objectives have been specifically defined for timber production, tourism, fisheries, wildlife, native resources use, resource access, recreation, education and research, and cultural heritage. With the exception of timber harvesting, all targeted goals are either qualitative or difficult to quantify.

The timber harvesting subobjective has been met in terms of maintaining growing stock of 28,879,000 m<sup>3</sup> and meeting the anticipated industrial demand of 110,000 m<sup>3</sup>/year. The actual harvest has yet to exceed 70% of that amount on an annual basis. There is

clearly an opportunity to seek out additional harvest opportunities to more fully utilize available harvest volume.

This audit has recommended that efforts by MLFI be increased to develop opportunities for First Nations participation in harvesting and silvicultural activities. The target has been weakly met but there is an opportunity for improvement as indicated in the discussion supporting Recommendations 1 and 2.

The auditors commend MLFI for its forest biomass harvest operations. It is consistent with the creative approach to forest marketing that was evident in conversations with staff from MLFI and operators.

#### Values Dependent on Forest Cover

All subobjectives to protect and maintain natural values dependent on forest cover have been met, specifically, habitat requirements for white tailed deer, pileated woodpecker, bald and golden eagles, red shouldered hawks, other forest-nesting raptors, and great blue herons.

In the 2006 FMP, a subobjective has been included to protect critical habitat for species at risk in the forest. This audit has included a recommendation to better manage the confidentiality of sites containing sensitive values. The recent passage of the ESA will support achievement of this subobjective. From the narrow perspective of this audit, where this subobjective has only been in place for three years, the auditors conclude the intent of the subobjective has been addressed, but it is too early to confirm how effective it has been.

#### Silviculture

The silvicultural objective in the 2001 FMP includes a target of demonstrating a positive economic return as measured by net present value. This has not been completed. In fact, the auditors know of no forest in Ontario that conducts this analysis. The target was dropped in the 2006 FMP. Based on evaluation of silvicultural records and observations in the field, the silvicultural objective has been met.

The Comparison and Trends Analysis of Planned vs. Actual Operations has been done in two volumes, one for the portion of the forest originating from the former Lanark Crown Management Unit, and the second dealing with the former Mazinaw Crown Management Unit. This is an unusual but practical approach to explaining the recent trends on the MLF (Appendix 7).

Both reports carefully explain the difficulty in tracking trends of a landbase that has changed its boundaries and some of its basic descriptive indicators. For example, forest units were changed in the 2001 FMP, making comparisons of earlier information

challenging. The reports note that harvest level by forest unit cannot be meaningfully compared between the two former crown management units because records from each forest are based on different forest units.

Most trends noted are reasonable and demonstrate an acceptable performance level. However, harvest levels (reported in terms of both harvest volumes and area harvested) are low, reported at 67% and 69% of that planned for the 2001 -2006 and 2006-2009 periods, respectively. This is an increase over the harvest reported in previous terms. The reports offer suitable explanation for this performance, including small harvest blocks, silvicultural complexity, market variability, and a large number of operators working on the forest. Mazinaw-Lanark Forest Inc. has made efforts to find new markets for its available volume, and has initiated a biomass harvest as part of this effort. However, the history of this forest is one of chronic underharvesting. This was one of the factors considered when the audit team made Recommendation 1 regarding opportunities for greater First Nation involvement in the MLF.

Trends in both reports demonstrate generally acceptable performance in terms of achieving renewal and maintenance, once these have been adjusted for the lower than planned harvest levels. The reports indicate high silviculture treatments costs, and some of that is explained by the small blocks and complex prescriptions. However, the MLF also reports an underperformance in achieving chemical treatment targets, attributed to a preference for non-chemical alternatives whenever these are deemed viable. When linked to the missed target from the 2001 FMP silvicultural objective to measure silvicultural return on investment, this observation supports Recommendation 11 to examine opportunities for chemical tending and cleaning.

The company's performance in achieving regeneration success is low. Shortfalls are attributed to procedural performance rather than real deficiencies on the ground. Audit team observations support most of the rationale provided. It is expected that demonstrated performance in this area will improve dramatically over the next five-year reporting period, as MLFI and OMNR improve their calibration of the time required for natural renewal and the expectations from the silviculturally complex sites are refined.

As noted earlier, success rates for oak renewal are very low (2%). The audit team has made Recommendation 10 to establish a more realistic red oak renewal level.

Having acknowledged the challenges with regeneration assessment, and regeneration success in the case of red oak, in this highly productive and competitive forest, the auditors still conclude that the forest is being managed sustainably. Timber supply is well planned. It should be a predictable resource available for economic development in the area for the foreseeable future. Forest wildlife, as defined by the habitat they require, are planned for with increasing rigor. The audit team is convinced the managers of the MLF are responding to increased emphasis in species at risk with suitable attention.

Roads on this forest are generally well established and, with the exception of Recommendation 4 for improvements on water crossings, well maintained. No new primary roads were constructed through the audit period. The audit team concludes that roads on the MLF are located in a manner that reduces their impacts on the forest environment to an acceptable level.

Harvest operations had little visible impact on soil. Rutting, which might be expected in some parts of the MLF, was noted on one site. This is commendable since auditors normally bias their site inspections towards low-lying areas likely to have sensitive soils.

The impacts of harvesting on water quality were assessed at both water crossings and on harvest sites adjacent to aquatic habitat. Operations adjacent to aquatic habitats were consistently within practice standards established for operations in riparian zones.

In summary, the ecological components of the MLF, which are most likely to be influenced by forest operations, are being managed in a sustainable manner. The audit team is confident that the MLF, if managed as currently planned, will be maintained for the benefit of future generations as proclaimed in the CFSA.

The CFSA also speaks to sustainable social and economic benefits from the forest. The premise of the audit team is that if the structural integrity of the forest is sustained, the opportunities for social benefits will be maintained as well. There is clearly the wood fiber available to increase the economic benefits from the MLF.

#### 4.8 Contractual Obligations

The audit team reviewed the terms and conditions in SFL #542621 issued to MLFI. In general, the auditors noted a high level of conformance with the contractual requirements of the SFL. Two recommendations addressing opportunities for aboriginal participation in the forest sector have been issued.

The SFL does not list any wood supply commitments. Wood allocation is managed internally among the shareholders of MLFI. Interviews with several shareholders confirmed overall satisfaction with the wood supply process. The company has made open market and tendered sales available as specified in the SFL.

The 2006 FMP, AWSs, and annual reports have been completed as required. The auditors noted that several annual reports did not meet submission deadlines. This has not been the case with the most recent reports. The auditors have made a suggestion that MLI address this consistently.

The company effectively responded to a salvage opportunity. There were no operations required for fire or insect control during the term of the audit.

The company and the OMNR district have diligently addressed the findings of the 2004 independent forest audit. Each recommendation from the audit was carefully considered and action to address each recommendation is either completed or in progress.

The company maintained an amount exceeding the required minimum balance in its Renewal Trust Fund throughout the audit period, and has no outstanding balance in its Forestry Futures Trust and Consolidated Revenue Fund obligations accounts.

The auditors were impressed with the complexity and effectiveness of the silvicultural efforts by MLFI. As noted elsewhere, the small size of the operating blocks and the relatively large and diverse number of potential crop trees constitute a very challenging management scenario, requiring detailed and expert professional opinion on an ongoing basis. The audit issued Recommendation 10 requiring the MLFI and the OMNR district to review its targets for red oak regeneration. It is evident that MLFI is making a very significant effort to regenerate this species, but the auditors are not convinced that the high target for this species is either practically achievable or ecologically desirable.

Appendix 3 provides detailed comments on the performance of MLFI in meeting its SFL obligations.

#### 4.9 Conclusions and License Extension Recommendations

The company has addressed the requirements of its SFL and met, in a reasonable manner, the planning and operational requirements of the CFSA, its regulated manuals, and other guidance provided to MLFI.

The company and OMNR have demonstrated a strong level of commitment to the forest. The significant obligations to public consultation have been met, with audit recommendations for additional efforts with respect to aboriginal involvement. Forest management planning, with some minor exceptions, has been completed in accordance with all requirements. The implementation of planning efforts has been well done, particularly when considered in light of the silvicultural complexity of the forest itself.

The company and OMR both have sufficient infrastructure in place to support the management and operational obligations of MLF. There is an effective monitoring program in place.

The auditors are satisfied that MLFI and OMNR have met the requirements to set useful management objectives, that, as near as is possible, will ensure sustainability of the ecologic, economic and social benefits from this forest.

The audit team concludes that management of the MLF was generally in compliance with the legislation, regulations, and policies that were in effect during the term covered by the audit, and the MLF was managed in compliance with the terms and conditions of the SFL held by MLFI. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol. The audit team recommends that the Minister extend the term of SFL #542621 for a further five years.

## Appendix 1 – Recommendations

Independent Forest Audit – Record of Finding	
Recommendation 1	
<b>Principle:</b>	2. Public Consultation and Aboriginal Involvement
<b>Criterion:</b>	2.5. 2 Participation of aboriginal peoples in the benefits provided through forest management planning
<b>Procedure(s):</b>	2.5.2 Review whether aboriginal peoples were provided with, and whether they availed themselves, of opportunities to achieve more equal participation in the benefits provided through forest management planning and assess the results.
<b>Background Information and Summary of Evidence:</b> Four Ontario Algonquin Nations and the Mohawks of the Bay of Quinte were invited to participate etc. Efforts to consult with all five were undertaken by the audit team.  The two First Nations are the Algonquins of Pikwakanagan and the Mohawks of the Bay of Quinte. During the audit, a discussion with the forestry manager from Pikwakanagan indicated that the MLF is not of important interest to their community. In discussions with the Mohawks of the Bay of Quinte, no interest was expressed in the MLF or any need identified to discuss forest management on the area. In a review of documentation, it was evident that the OMNR made efforts to consult with the two First Nations and that no reciprocal interest was provided.  Meetings were held with several representatives from three Algonquin Nations during the audit: the Algonquin Nation of Kijicho-Manito (or Bancroft Algonquins); Sharbot Obaadjiwan First Nation (generally situated in the Sharbot Lake area); and, Snimikobi (Beaver Creek) Algonquin First Nation. The Algonquins (which includes the Algonquins of Pikwakanagan, the above three Algonquin communities and several other Algonquin communities) are currently in negotiations with the Province of Ontario with respect to a land claim made over a large part of eastern Ontario that stretches over most of Algonquin Park, the Ottawa Valley Forest, and the northern part of the MLF. While the Algonquin communities have interests in numerous forests, the communities of Snimikobi and Sharbot Obaadjiwan indicated that the MLF is of primary importance to them, mostly because of location. The Algonquins of Kijicho-Manito indicated that the MLF is of secondary interest to them. It is important to note that in the forthcoming forest management plan more Algonquin communities have indicated an interest in the MLF.  Based on the evidence available it appears that aboriginal communities and peoples receive little	

economic benefit from the MLF. It is not possible to know for certain as there may be workers in mills or in woods operations that are aboriginal but do not identify themselves. In the examination of the annual reports, and to the knowledge of the three Algonquin community leaders, none of the licence holders on the MLFI are Algonquin community members and there are no Algonquin members working in forest harvesting.

During the audit term the economic benefits from forest management were identified to be five tree-marking projects and one tree planting project that were directed to one of the Algonquin communities. Both MLFI and the Algonquin community expressed dissatisfaction with this endeavour. Efforts were also made by OMNR and MLFI to train certified tree markers from this one community. There is a perception in this specific Algonquin community that opportunities are not provided because they are outsiders. They are concerned that the lack of opportunities has prevented them from developing capacity and maintaining workers. In effect, they are indicating that the lack of opportunity creates a cycle that prevents the building of the capacity they need to be successful.

The other economic benefits that flow to aboriginal people from forest management are the per diems for participation on the forest management planning team and funds provided for values collection and preparation of the background information reports.

Community leaders from all three Algonquin communities have expressed concern about the lack of economic opportunities they are provided from MLF. All three have indicated an interest in a timber harvesting allocation or licence. Mazinaw Forest Management Corporation has indicated that it has a harvest allocation that is available for purchase. This has been communicated at a couple of LCC meetings but it does not appear that this has been communicated to all the Algonquin communities. Except for the Sharbot Obaadjiwan Algonquins, the Algonquin communities know little to nothing about MLFI and have never visited their offices.

The 2004 Independent Forest Audit commented on the desire of local Aboriginal communities to achieve a more equal benefit from forest management. The 2004 Independent Forest Audit made a recommendation that: "MNR in cooperation with Mazinaw-Lanark Forest Inc. must offer regular (suggested minimum annual) meetings with First Nation communities to discuss and address opportunities to participate in the economic benefits of forest management on the Mazinaw-Lanark Forest."

While there is evidence that points to this recommendation being followed up, it has not led to many tangible economic benefits to Algonquin communities. Furthermore, the Algonquin communities with an interest in the MLF have expanded with most of the community leaders having little to no knowledge of the MLFI. Overall, there has only been a negligible economic benefit from forest management accruing to the Algonquin communities with an active interest in this forest. Within the context of an independent forest audit it is not possible to gauge the capabilities and capacity of Aboriginal people to undertake various aspects of forest management. Experience with the limited silvicultural work undertaken showed that a great deal of effort was required on the part of MLFI and that success was challenging.

**Discussion:** The intention of Condition 34 of the Class Environmental Assessment was to achieve a more equal participation in benefits provided through forest management. That intention has not been achieved on the MLF and, furthermore, it appears that minimal progress has been achieved. At the same time, Algonquin involvement in the MLF has evolved. Two of the three Algonquin communities that were identified during the term of the audit were only recognized towards the end of the most recent FMP. As such, the economic interests of the Algonquin communities are likely to continue to evolve but economic aspirations must face the reality of very challenging economic times in the forest industry.

It is not the intention of the audit team to create recommendations that are prescriptive and of no longterm value. Rather it is important for there to be some clear communications around economic aspects of forestry and to engage in discussions with the Algonquin communities with an interest in the MLF.

It is recommended that OMNR and MLFI meet regularly (minimum once a year) with the Algonquin communities to discuss opportunities for more economic benefits in the MLF. Currently, a number of the Algonquin leaders participate on the planning team but, unfortunately, that is not a forum to discuss economic opportunities.

**Conclusion:** The criterion has not been met.

**Recommendation:** Ontario Ministry of Natural Resources and MLFI shall meet regularly (minimum once a year) with the Algonquin communities to discuss opportunities for more economic benefits on the MLF.

#### Independent Forest Audit – Record of Finding

##### Recommendation 2

**Principle:** 2. Public Consultation and Aboriginal Involvement

**Criterion:** 2.5.2 Participation of aboriginal peoples in the benefits provided through forest management planning

**Procedure(s):** 2.5.2 Review whether aboriginal peoples were provided with, and whether they availed themselves, of opportunities to achieve more equal participation in the benefits provided through forest management planning and assess the results.

**Background Information and Summary of Evidence:** The Background Information and Summary of Evidence from Recommendation 1 also applies to this recommendation along with the information provided below.

It is not clear to Algonquin communities why they do not receive economic benefits from the MLF. Furthermore, as described the Algonquin communities interested in this forest have evolved with some of them knowing little to nothing about the licence holder. The Condition 34 component of the annual reports, while providing the facts about economic opportunities involved in forest management, does not provide any indication as to why opportunities are not being created. The OMNR has established the Condition 34 Toolkit, which is intended for use by MNR staff and individual First Nations to document the current involvement in the forest sector economy as well as future objectives and associated strategies. It focuses efforts to realize economic benefits for the community and forms a record of negotiated objectives and strategies in the case of turnover of MNR staff and First Nation representatives.

**Discussion:** As many of the Algonquin communities with an interest in the MLF have only recently been identified, the Condition 34 Toolkit would be an appropriate and necessary way to begin dialogue about economic opportunities. Given the lack of economic benefits accruing to aboriginal peoples and the limited dialogue that has occurred, it is recommended that the Condition 34 Toolkit be utilized.

**Conclusion:** The criterion has not been met.

**Recommendation:** The OMNR, with the participation of MLFI, shall implement the Condition 34 Toolkit on the MLF to assist in documenting current involvement in the forest sector economy as well as defining future objectives and associated strategies.

#### Independent Forest Audit – Record of Finding

##### Recommendation #3

**Principle:** 3. Forest Management Planning

**Criterion:** 3.5.2 FMP Area of Concern Prescriptions

**Procedure(s):** Review the AOC prescriptions and assess whether adequate information was available for AOC planning.

**Background Information and Summary of Evidence:** There was insufficient funding provided to complete required biological surveys.

**Discussion:** According to records and interviews with staff, there were problems with delays in funding for values surveys such as moose aquatic feeding areas, nest sites, and deer wintering areas. In the current planning cycle, there have also been funding delays. Although the current government fiscal situation may explain this in the short term, the fact is that the surveys are planned well in advance, and the district has applied for funding in a timely manner. Corporately, OMNR needs to ensure that money is deployed in a way that meets the biological need rather than the fiscal need.

**Conclusion:** Funding for values surveys is not received soon enough to be useful for forest management planning purposes.

**Recommendation:** Corporate OMNR must ensure that funding for biological values surveys arrives for use in forest management planning in a timely manner.

#### Independent Forest Audit – Record of Finding

##### Recommendation 4

**Principle:** 4. Plan Assessment and Implementation

**Criterion:** 4.2 Operations in AOCs must be conducted in compliance with all applicable laws and regulations including the CFSA and the approved operational prescriptions of the FMP and AWS.

**Procedure(s):** Assess the effectiveness of implementation of the approved effectiveness monitoring program for any AOC prescriptions used during operations that are exceptions to guides

**Background Information and Summary of Evidence:** As part of the field audit, the auditors examined eight AOC water crossings. One bridge, which is the responsibility of OMNR, was deficient. The bridge passed the engineering inspection performed by OMNR but the auditors observed open

decking, no corner signs, and no road signs.

**Discussion:** Although these matters are relatively small, MLF is in an area where access is a major public concern and operators have been criticized for their installations. Consequently, government bridges must set an example.

**Conclusion:** The bridge was deficient.

**Recommendation:** Ontario Ministry of Natural Resources should inspect bridges that have been assigned as their responsibility and ensure all environmental requirements are met.

#### Independent Forest Audit – Record of Finding

##### Recommendation 5

**Principle:** 4. Plan Assessment and Implementation

**Criterion:** 4.2 Operations in AOCs must be conducted in compliance with all applicable laws and regulations including the CFSA and the approved operational prescriptions of the FMP and AWS.

**Procedure(s):** Provide an assessment as to whether the AOC prescription was appropriate in the circumstances.

**Background Information and Summary of Evidence:** Area of concern prescriptions for endangered species were well marked on all operational maps. However, by doing so, the requirement to ensure the location of these sites was protected in a confidential manner was compromised.

**Discussion:** Auditors received a number of comments that the public nature of planning is drawing attention to sensitive values. The nature of the prescription means that buffers have a particular pattern and location that identifies the value to any knowledgeable person, regardless of rules restricting labels on maps, etc. The audit team felt that there was merit to the concern with the level of visibility of these sensitive areas primarily due to operational requirements of plan implementation. Although there are confidentiality rules in place at a corporate level, especially within OMNR, they are not clear at the operational level where more people are involved and there is real risk to protected sites.

Some immediate adjustments can be made by MLFI to their operations manual to ensure that only people in a "need to know" position are informed of the particulars of sensitive values. For example, tree markers will clearly be aware of the details of the prescription and will be integral to the identification of many sensitive values.

There are findings related to this issue that the audit team felt needed review: operational confidentiality, consideration of alternative prescriptions that meet the intent of the ESA, and consideration of the FMP as an instrument of the ESA.

**Conclusion:** Area of concern identification may, inadvertently, be increasing the risk to endangered species.

**Recommendation:** Mazinaw-Lanark Forest Inc., with the assistance of district OMNR staff, should review their operations manual requirements to ensure that information about sensitive values is provided only to those required to know for implementation purposes.

#### Independent Forest Audit – Record of Finding

##### Recommendation 6

**Principle:** 4. Plan Assessment and Implementation

**Criterion:** 4.2 Operations in AOCs must be conducted in compliance with all applicable laws and regulations including the CFSA and the approved operational prescriptions of the FMP and AWS.

**Procedure(s):** Provide an assessment as to whether the AOC prescription was appropriate in the circumstances.

**Background Information and Summary of Evidence:** The auditors inspected AOC sites that identified endangered species. In the case of the species in question, ginseng, the plant has significant economic value, and is harvested for sale, surreptitiously, on an ongoing basis. The AOC designation on maps, while useful for identifying the value and ensuring forest operations take care to protect it, may serve as an indicator to ginseng harvesters, thereby actually harming the plant sites.

**Discussion:** Most sites in eastern Ontario that currently have sensitive plant values have been logged previously, and likely several times. Auditors verified this on one of the sites where the value still exists. Arguably, it is likely that the risk from logging damage is less than from access. The existing

high level of access in the area (the company builds few of the roads), combined with a high profile planning exercise, may be more of a risk to the sensitive site than forestry operations.

The ESA contains provisions for instruments and permits that do not seem to have been part of the discussion with MLFI as yet. This is not surprising because the 2006 FMP predates the ESA, and implementation of the ESA is still being worked out. However, the ESA has been in effect now for two-and-a-half years and implementation is lagging behind. The audit team believes that OMNR will need to help MLFI explore possible alternative approaches to full compliance with the ESA, while ensuring that necessary constraints are as practical as possible to allow company operations to continue.

**Conclusion:** The designation of an AOC may inadvertently cause harm to an endangered species.

**Recommendation:** Ontario Ministry of Natural Resources needs to reexamine with MLFI the prescriptions for sensitive values and evaluate alternative prescriptions (which may still be under development) that will comply with the intent of the Endangered Species Act. This should include consideration of the risk to conservation of the sensitive values that occurs through planning procedures that may inadvertently make sites known.

#### Independent Forest Audit – Record of Finding

##### Recommendation 7

**Principle:** 4. Plan Assessment and Implementation

**Criterion:** 4.2 Operations in AOCs must be conducted in compliance with all applicable laws and regulations including the CFSA and the approved operational prescriptions of the FMP and AWS.

**Procedure(s):** Provide an assessment as to whether the AOC prescription was appropriate in the circumstances

**Background Information and Summary of Evidence:** The auditors reviewed the MLFI, district OMNR, and corporate OMNR approaches to satisfying the requirements of the ESA. District OMNR and the company have made reasonable efforts to implement the requirements of this legislation. However, the auditors found a lack of corporate direction.

**Discussion:** There was considerable discussion during the audit about the lack of direction that was provided by OMNR for operational solutions to working near endangered species. A recent FMP note (#3, Oct. 1 2009) entitled *Endangered Species Act Habitat Regulations and Forest Management Plans*,

seemed to provide appropriate direction to the SFL and the OMNR district staff. This included the statement "...The SFL will contact the District SAR Biologist or SAR contact regarding the pursuit of an ESA, 2007 flexibility tool. In consultation with the FMP biologist and forester they shall assess if the proposed activity will be considered as damaging or destroying habitat." Given the newness of the ESA and this memo, which was issued after the audit field work, the auditors did not pursue more details. This note seems to be consistent with the intent of the ESA, which indicates that an FMP is an instrument of the ESA. Subsequently, corporate OMNR stated that "Government has not decided on the use of FMPs as an instrument under ESA Section 18". They also stated "ESA policy direction which may help to determine and evaluate alternative prescriptions in support of the ESA flexibility provisions is not available", which the audit team believes means that FMP Note #3 is not yet in effect. The corporate OMNR position was that a recommendation is premature. The audit team decided that since the ESA has been law for almost two-and-a-half years, and there is confusion being created by indecision, a recommendation is required to encourage OMNR locally and corporately to work with MLFI, which has serious and fair concerns about the implementation of the ESA.

**Conclusion:** The corporate approach of OMNR to meeting its obligations under the ESA needs to be improved.

**Recommendation :** Corporate and district OMNR should work with MLFI on: the implementation of the ESA, seeking practical operational approaches to the protection and recovery of the endangered species; clarifying to the company how and when the ESA flexibility tool can be used; and, how the company can make their operations comply with the ESA through the FMP, as an instrument of the ESA.

#### Independent Forest Audit – Record of Finding

##### Recommendation 8

**Principle:** 4. Plan Assessment and Implementation

**Criterion:** 4.3.1 Harvest

**Procedure(s):** Review and assess the field implementation of approved harvest operations.

**Background Information and Summary of Evidence:** The auditors observed several blocks where operators had several small blocks open simultaneously.

**Discussion:** The distribution of harvest area among the shareholders is based on the provisions of

the Unanimous Shareholder Agreement for MLFI. This agreement outlines the entitlements of each shareholder on the Mazinaw and Lanark portions of the management unit and the process by which allocations are assigned. Areas and associated volumes may be assigned to individual companies based on their traditional operating areas, while a portion of allocations may be allocated to groups of licensees. One such group is the Mazinaw Forest Management Corporation (MFMC), with its membership of 16 independent logging companies with long established ties to the Mazinaw side of the management unit. Sixty percent of the harvest allocations are assigned to the MFMC group. Consideration is also given to four mill owners who formerly held Order-In-Council licences on the Mazinaw side of the management unit prior to the establishment of the SFL. Mazinaw-Lanark Forest Inc. withholds approximately 8% of the available harvest area (AHA) in trust for tendered sales to be sold on the open market. Obviously, the timber allocation process on the MLF can become cumbersome.

Harvest allocations for the MFMC may be partitioned further among the licensees through the group's internal discussions. This process sometimes leads to single harvest blocks being partitioned among two or more licensees, which can result in administrative and logistical headaches for the company and OMNR on several levels (e.g., licensing, compliance monitoring, and subsequent silviculture work). The process may have been well-intentioned when conceived, but the auditors observed that the partitioning of single blocks to several licensees is inefficient organizationally and can have detrimental consequences to follow-up operations. The auditors strongly urge MLFI and MFMC to develop an alternative harvest allocation model that discourages the further division of single harvest blocks into smaller, more numerous blocks.

**Conclusion:** The allocation of harvest blocks is unnecessarily complex, and results in several operators having several blocks open at the same time. This action has implications for silviculture and plan amendments.

**Recommendation:** Mazinaw-Lanark Forest Inc. shall enter into discussions with MFMC for the purpose of considering refinements to the harvest allocation process that will promote greater efficiency and minimize apportioning single harvest blocks into smaller parcels.

#### Independent Forest Audit – Record of Finding

##### Recommendation 9

**Principle:** 4. Plan assessment and implementation

**Criterion:** 4.3 Harvest

**Procedure(s):** Review and assess the implementation of approved harvest operations.

**Background Information and Summary of Evidence:** The auditors observed the small size and number of clear cut harvest blocks on the MLF. The application of NDPEG guidelines was observed to be superfluous, costly, and ecologically unnecessary.

**Discussion:** In the opinion of the auditors, application of the Forest Management Guidelines for Natural Disturbance Pattern Emulation (NDPEG) on the landscape in this part of Ontario appears to be inappropriate where continuous forest cover dominates. Employment of this guideline requires a burdensome planning, analysis, tracking and reporting process for planned clearcuts and final removal shelterwood harvests. As noted in the 2006 FMP, the average actual clearcut size on the MLF over the 2001-2006 period was 25.7 ha. The planned average clearcut size for the 2006-2011 term is 18.1 ha, with 93% of the planned cuts being less than 50 ha in size. The stand level requirements for retaining residual and peninsular patches are not subject to a minimum clearcut patch size, although there is a provision in the NDPEG where stand level requirements may be relaxed under certain circumstances in consultation with regional forest planning staff. Exercising this provision still requires rather tedious documentation outlining the rationale for relaxing the NDPEG requirements for each block <100 ha in size. The auditors observed that many of the clearcut patches contain a component of shade- and mid-tolerant species that would serve as undisturbed patches. Given the residual tree retention requirements of the NDPEG, the small average planned clearcut size, and the fact that only 16.5% of the harvest is conducted using the clearcut system, the auditors question the rationale for imposing a requirement of retaining residual and peninsular patches under these circumstances and also question the need to provide extensive rationale for relaxing the NDPEG for clearcuts <100 ha in size. The auditors witnessed situations where application of the NDPEG resulted in no apparent improvement in the ecological outcome of the harvest operations. The auditors understand that OMNR intends to replace the NDPEG in 2010 with a Stand and Site Guide. The auditors hope that the new guide includes more flexibility in its approach toward planning clear-cuts in the Great Lakes-St. Lawrence Forest Region and significantly reduces the volume of documentation and analysis required for planning small clearcuts (<100 ha).

**Conclusion:** The application of the NDPEG is inappropriate on the MLF.

**Recommendation:** Corporate OMNR shall review the prerequisites for implementing clearcutting in the Great Lakes-St. Lawrence Forest Region with the goal of reducing documentation and analysis requirements, particularly in situations where clearcut sizes are less than an established threshold. Consideration should be given to eliminating onerous documentation requirements for clearcuts that are smaller than the minimum threshold.

## Independent Forest Audit – Record of Finding

### Recommendation 10

**Principle:** 4. Plan assessment and implementation

**Criterion:** 4.4 Renewal

**Procedure(s):** Review and assess the field implementation of approved renewal operations.

**Background Information and Summary of Evidence:** Mazinaw-Lanark Forest Inc. is investing a large effort into red oak renewal. The efforts did not have a high success rate.

**Discussion:** The auditors acknowledge the continuing challenges MLFI confronts in its efforts to renew red oak, as noted in the Year Ten Annual Report and the 2006 FMP. Renewal results are inconsistent, with some failures difficult to rationalize. Occasionally, there are unexpected surprises where thriving oak regeneration was equally difficult to explain. Although there is a social expectation (incorporated as an objective in the 2006 FMP) to maintain the quantity of oak on the MLF landscape at levels that disregard historical norms, the auditors question the wisdom of continuing to pursue this objective given the mediocre results to date (e.g., 2% success rate identified in the Year Ten Annual Report). The auditors commend MLFI for its continuing dedicated effort to renewing oak and maintaining its presence on the landscape, but the expectations may be unjustifiably high and perhaps financially unviable. The auditors understand that the FMP objective reflects the expectation found in the Madawaska Highlands Land Use Plan, which may have been developed without the benefit of the historical knowledge that has come to light in recent years.

**Conclusion:** The red oak renewal target may be too high. The effort to renew this species at targeted levels appears to be inconsistent with what the forest sites would normally sustain.

**Recommendation:** District OMNR should petition the authors of the Madawaska Highlands Land Use plan to establish a more realistic red oak renewal objective.

## **Independent Forest Audit – Record of Finding**

### **Recommendation 11**

**Principle:** 4. Plan Assessment and implementation

**Criterion:** 4.4 Tending and protection

**Procedure(s):** Review the field implementation of approved tending and protection operations.

**Discussion:** Tending activities occurred on 2,011 ha over the first four years of the 2004 audit term, which was comprised of 980 ha of stand improvement cutting in uneven-aged managed stands, 248 ha of stand improvement in even-aged stands, 677 ha of manual tending, and 106 ha of ground chemical application.

In general, the audit team witnessed an effective tending program. Much of the renewal in the stands that were inspected exhibited good growth and little sign of suppression. There were situations where tending treatment was needed or could have been applied more aggressively or earlier. In some oak shelterwood areas, ironwood is an aggressive competitor where repeated efforts to manually remove this species are often warranted to ensure the successful renewal of potential oak crop trees.

Conformity to the silvicultural ground rules was apparent and the treatments being applied appear to be effective on the tending treatment sites that were visited. The prescribed tending for each site and the desired future forest unit were suitable, consistent with the prescriptions, and should maintain forest productivity. The audit team is of the opinion, however, that there may be additional opportunities for applying chemical tending treatments, especially where the objective is to establish shade intolerant species, such as red pine, and these crop trees will be competing with poplar and other aggressive species. Under such circumstances, chemical treatment may be the only effective option.

The auditors are aware that MLFI has a stated preference for using alternatives to chemical treatments. However, there appear to be situations where chemical treatment would be more cost effective. The audit team notes that increased use of chemical treatment should be conditional upon cost and efficacy.

**Conclusion:** Manual tending treatments have been costly and ineffective on some competitive sites.

**Recommendation :** Mazinaw-Lanark Forest Inc. shall examine if there are additional opportunities for chemical tending to increase the effectiveness of regenerating high risk and high investment areas.

### Independent Forest Audit – Record of Finding

#### Recommendation 12

**Principle:** 5. Systems Support

**Criterion:** 5.2 Human resources

**Procedure(s):** Review and assess the organization's commitment to awareness, education and training.

**Background Information and Summary of Evidence:** The audit team reviewed the training program for MLFI. The large number of relatively small operators makes the training program complex. The auditors did not find evidence all staff working on the MLF had been effectively trained.

**Discussion:** The audit team considered the level of effort that the company puts into training of operators. A training meeting is held once a year to update all of the operators and tree markers on the operations binder. The company requires that at least one representative from each operator attends the training session, although there is no penalty for not attending and MLFI has no procedures to verify that the appropriate staff from each of the operators has been appropriately trained.

Training is at a lower level than for larger companies which use a formal Environmental Management System, which are independently audited. The number of operators, and the fact that they are all separate businesses contributes to a more complicated situation with a potentially onerous record-keeping system. The protocol requirement is to "ensure current general knowledge as well as knowledge specific to an individual's responsibilities in the sustainable forest management (SFM) system". On this basis, the audit team felt the company needs to verify, prior to the start of operations on each block, that operators have staff that have attended the training session and are aware of the requirements of the operations manual.

**Conclusion:** The training and awareness of personnel working on operations is deficient.

**Recommendation:** Mazinaw-Lanark Forest Inc. must verify that operators have staff that are aware of the requirements of the operations manual prior to the start of operations on each block.

### Independent Forest Audit – Record of Finding

#### Recommendation 13

**Principle:** 6. Monitoring

**Criterion:** 6.2.1 SFL holder compliance monitoring

**Procedure(s):** Review the five year compliance strategy and the annual plans of action.

**Background Information and Summary of Evidence:** Compliance inspectors, as a matter of practicality, are reviewing and approving their own compliance reports. These signing-off arrangements are unusual and not consistent with recommended practices.

**Discussion:** The five-year compliance plan prepared by MLFI met all of the requirements outlined under the applicable Forest Information Manual and OMNR's *Guideline for Forest Industry Compliance Planning, 1998* that were in effect when the plans were approved. The plans include a background description of the MLF as it relates to the forest compliance monitoring program, as well as comprehensive sections dealing with compliance issues, goals, objectives, and strategies. Monitoring and reporting procedures are outlined, measures for dealing with non-compliances are described, and roles and responsibilities for implementing the compliance program are defined. The company's compliance plan is very complete and meets the applicable requirements. In the opinion of the auditors, the compliance plan is sufficient and appropriate for the operations that were anticipated on the MLF. One aspect of concern, however, relates to the signing-off responsibilities for inspections. Currently, the compliance inspector has the authority to sign off on his/her own inspection, and the General Manager has the authority to sign-off reports of non-compliance. The auditors find these signing-off arrangements to be unusual. Furthermore, Directive FOR 07 03 04 in the *Forest Compliance Handbook (2008)* does not recommend this practice. The auditors concur that having inspectors review and approve their own reports is not an appropriate practice and advise that the Compliance Plan Strategy be amended giving the General Manager responsibility to review and approve all compliance monitoring reports filed by company compliance inspectors.

**Conclusion:** Company compliance inspectors should not be approving their own reports.

**Recommendation:** Mazinaw-Lanark Forest Inc. shall amend its 2006-2011 Compliance Plan Strategy to indicate that the General Manager shall be responsible for reviewing and approving all compliance monitoring reports filed by company compliance inspectors.

#### Independent Forest Audit – Record of Finding

##### Recommendation 14

**Principle:** 6. Monitoring

**Criterion:** 6.2 SFL holder compliance

**Procedure(s):** 6.2.1 (4) Examine whether the SFL holder has maintained overall forest management oversight.

**Background Information and Summary of Evidence:** One operator has been documented for several non-compliances. The remedies and fines assigned have not been consistent with the requirements of the Forest Compliance Handbook.

**Discussion:** The auditors noted the record of one particular licensee whose compliance performance, although improving mildly, continues to be substandard. The 2004 independent forest audit noted that two licensees were responsible for 80% of the occurrences of non-compliance. In response to the recommendations from that audit, MLFI and OMNR have worked diligently to encourage the problematic overlapping licensees to raise their compliance performance through training, education, and support. Both organizations have corrective remedies at their disposal and have utilized some of them when required. Recommendation #7 in the 2004 audit suggested that OMNR use the "stepped incremental provisions" of the *Forest Compliance Handbook*, such as withdrawing harvesting privileges, as a method of persuading better compliance. The auditors note that three penalties recommended to be imposed on a particular poor performer by OMNR Bancroft District in 2006 were significantly reduced by the Regional Director following representations made by the overlapping licensee. This operator's arguments introduced sufficient doubt around the circumstances, plus the Regional Director felt that there was no willful intent to commit the infractions nor were any values impaired. Following these incidents, this operator committed two other non-compliances, both of which involved further (mild) fines, a stop-work order, and a repair order. The auditors understand from MLFI and OMNR that inadequate supervision on the part of the licensee is the primary cause for these non-compliances. The failure to provide sufficient supervision demonstrates the licensee's lack of commitment to comply with the forest regulations. The auditors

note that this particular operator has a long history of substandard performance, which has only improved somewhat very recently. Further disregard for the regulations or provisions of the FMP by this specific operator, particularly if attributed to a lack of proper supervision, would be unacceptable in the opinion of the auditors. In order to ensure that acceptable compliance is achieved, the auditors are reissuing a recommendation similar to one from the 2004 Independent Forest Audit.

**Conclusion:** OMNR is not following the stepped incremental provision of penalties to effectively correct poor compliance performance.

**Recommendation:** Ontario Ministry of Natural Resources Bancroft shall utilize the full remedial provisions of the Forest Compliance Handbook, including the suspension and/or cancellation of harvest licenses, or consider applying other innovative remedies where orders and/or monetary penalties are not resulting in corrective actions from operators with consistently poor compliance records. Ontario Ministry of Natural Resources and MLFI shall ensure all licensees are aware of their obligations to supervise operations and ensure that all operators are provided with the most up-to-date maps and information. Mazinaw-Lanark Forest Inc. shall also utilize the provisions available under the Unanimous Shareholders Agreement to induce better compliance performance.

#### Independent Forest Audit – Record of Finding

##### Recommendation 15

**Principle:** 6. Monitoring

**Criterion:** 6.3.(3) Silvicultural standards and assessment

**Procedure(s):** Assess the actual level of the overall monitoring program

**Background Information and Summary of Evidence:** Mazinaw-Lanark Forest Inc. is not meeting its FMP obligations with respect to monitoring of silvicultural success.

**Discussion:** Over the first four years of the 2004-09 audit term, 2,562 ha of renewal areas were surveyed for regeneration success, which represents 33% of the planned level of 7,858 ha (pro-rated averages from the 2001 FMP and 2006 FMPs). According to discussions with MLF staff, the level of achievement is somewhat misleading, as the estimates used to develop the planned assessment levels for the 2001 FMP were calculated incorrectly and over-inflated as a result. Examination of the Year Ten Annual Report (2005-06) shows that the level of achievement over the 2001-06 FMP term was 29% of the planned assessments. The achievement levels over the first two years of

implementation of the 2006 FMP are 25% of the five-year target, somewhat less than the 40% level expected (assuming that 20% of the target should be achieved on average each year). Company staff report that approximately 2,000 ha were assessed for FTG in 2008, which would raise the achievement level to 50%, but still short of the 60% expected achievement rate. The auditors are satisfied that MLFI maintains a robust silviculture effectiveness monitoring program, but are somewhat concerned that the actual level of monitoring is not keeping pace with the levels projected in the FMP. The Year Ten Annual Report recognized the shortfall in the regeneration assessment effort (in spite of the unrealistic target) and recommended that MLFI ensure that it secure adequate resources to fulfill its regeneration assessment commitments. The previous IFA indicates that the shortfall in accomplishing regeneration assessments has been an ongoing shortcoming on the MLF, even on the former Mazinaw and Lanark Crown Management Units before the SFL was established. Recommendation #12 in the 2004 IFA directed MLFI to essentially fulfill its FTG and post-harvest survey commitments. The auditors acknowledge that the rate of annual achievement and assessment effort has increased in recent years, and hope that this trend continues. However, the efforts to date still have not achieved the FMP targets. Neither are the assessment rates keeping pace with the level of harvest. The auditors support the recommendation made in the Year Ten Annual Report and believe that this longstanding issue should be addressed.

**Conclusion:** The Company is not meeting its FTG monitoring targets.

**Recommendation:** Mazinaw-Lanark Forest Inc. shall ensure that adequate resources are available to more closely align the level of silviculture assessment monitoring to the level projected in the approved FMP.



## **Appendix 2 - Management Objectives Table**

The following table outlines the audit team's assessment of achievement of management objectives from the 2001-2021 FMP. This analysis has been aided by the Assessment of Objectives and Target Achievement completed by MLFI as part of their Year Ten Annual Report.

In the auditor's opinion all objectives have been addressed, or were in progress in meeting the objectives. This was sufficient to conclude the objective was being met as a function of ongoing activities. Auditor comments note where a recommendation in this audit is pertinent to the stated management objectives.

**Table 2. The audit team's assessment of the achievement of management objectives for the 2001-2021 FMP.**

<b>Objectives &amp; Targets</b>	<b>Assessment of Achievement</b>	<b>Auditor Comments</b>
<b>Objectives for Forest Diversity</b>		
<b>Broad Objectives</b>  To ensure that the current biological diversity of forests is not significantly changed, and where desirable and practical, is restored to reflect the pre-settlement forest.	<p>Table 5 of the FMP shows that preferred habitat for most indicator species has increased or remained stable. All forest diversity targets, with the exception of red oak, were achievable for all terms.</p> <p>The target to maintain 15,000 ha of red oak (OR1) forest unit is unlikely to be achieved in the long term with 25,405 ha of OR1 in 2006 projected to decrease to 13,994 ha in 2086 and 4,026 ha in 2156.</p> <p>In addition, the designation of new Parks and Conservation Reserves and the exclusion of activities within ANSIs and Enhanced Management Areas, as well as the development of management prescriptions</p>	<p>The red oak target listed was converted to a volume target in the 2006 FMP.</p> <p>The audit has recommended that the premise for the red oak target be reviewed. The auditors' review of the information was not comprehensive, but it seems probable that the target, first defined in the Mazinaw Highlands Land Use Plan, is higher than the normal forest condition should sustain. (Recommendation 10).</p> <p>Otherwise, the auditors conclude that this objective is being met.</p>

	<p>and road Use Management Strategies within the Madawaska Highlands Land Use Area, helped to maintain representative forest types and patterns, thereby contributing to achievement of the broad objective.</p>	
To maintain the genetic diversity of tree species	<p>This objective is largely met by the natural regeneration that dominates the silviculture on the MLF.</p> <p>Where planting occurs, trees are planted that have been grown from local seed sources.</p> <p>Efforts have been made to promote the regeneration/protection of species at the natural geographic limits of their range through the development of appropriate Forest Operations Prescriptions.</p>	<p>This objective has been met. There is no apparent threat to the genetic diversity of this forest.</p>
To contribute to regional targets to establish and maintain representative protected forest lands as part of Ontario's natural heritage	<p>The company has defined subobjectives for landscape forest diversity, stand level diversity, old growth, and wetlands.</p> <p>Stand level diversity is maintained through very detailed operational prescriptions. This allows virtually every individual tree to be considered in light of its suitability in a particular stand.</p> <p>Old growth targets have been established and SFMM projections indicate they will be met in all terms.</p> <p>Additionally, identified old growth stands have been excluded from timber management activities.</p> <p>Wetland protection has been accomplished by application of normal AOC prescriptions, and water crossing and road maintenance.</p>	<p>The objective has been met. There was one water crossing noted on the forest that did not meet the specifications (Recommendation 4). However, this was noted for technical deficiencies in the water crossing, not because it was contributing to degradation of the stream.</p> <p>The auditors observed some very effective older water crossings. One in particular would not have met current installation standards, but has withstood a major beaver dam break upstream and allowed very little downstream movement of sedimentation.</p>

<b>Social and Economic Objectives</b>		
<b>Broad Objectives</b>		
To maintain the ecological and productive capacity of the forest in order to provide society with a sustainable harvest of forest-based material and social values	<p>Achieved through SEIM analysis.</p> <p>Achieved through implementation of comprehensive FMP.</p> <p>Achieved by operating the eastern part of the forest within the objectives set by the Madawaska Highlands Land Use plan.</p>	<p>There is ample evidence that the productive and ecological capacity of the forest has been maintained, and that currently planned activities will continue to maintain it.</p> <p>The actual harvest of timber has never met targeted volumes. This forest has a dedicated volume that is set aside for open market and tendered sales. These are rarely met. There is opportunity to increase the actual harvested volume by 40%, and still be operating within the limits defined by the FMP. It is an opportunity for other users of timber to source raw material, but it is not the obligation of MLFI to find or create the business to do so.</p> <p>The FMP process is accommodating the requirements of the tourism industry. They are well represented on the LCC and MLFI have modified operational prescriptions to address concerns about the visual effects of harvest operations on cottage users.</p> <p>There is little evidence of direct contribution to the health of fisheries population, but the company has met every operational requirement not to harm fish habitat. This, by default, meets the fisheries subobjective.</p> <p>Similarly, wildlife subobjectives have been met by incorporating wildlife management considerations, as provided by the application of guidelines and regulatory requirements, comments from OMNR</p>

		<p>district and stakeholder comments into the operating prescriptions in the FMP.</p> <p>The objective is being met.</p>
To facilitate the participation of Algonquin communities interested in participating in the benefits of forest management on the Mazinaw-Lanark Unit.	Achieved by providing economic opportunities from the silvicultural program. A First Nation's contractor was the sole tree planting contractor in 2006-2007. The SFL, OMNR, and Sharbot Lake Algonquin First Nation have collaborated to train and certify five members of the Sharbot Lake Algonquin Community as tree markers. MLFI will continue to provide access to tree-marking contracts. Further progress is ongoing.	This objective is being met, but there is more that can and should be done to encourage participation by the aboriginal communities. This is the subject of Recommendations 1 and 2.
<b><i>Objectives for Natural Values Dependent on Forest Cover</i></b>		
<b><i>Broad Objective</i></b>		
To plan and implement forest management to protect and maintain the natural values dependent on forest cover, while achieving sustainable use of the forest resources, and maintaining overall forest sustainability	<p>Specific objectives for natural values dependent on forest cover include: provision of white tailed deer habitat, mast producing species (beech and oak), pileated wood pecker habitat, bald and golden eagle habitat, red shouldered hawk habitat, other raptors, and nesting sites of the great blue heron.</p> <p>Other values are addressed in the indicators species habitats that are included in SFMM analysis.</p>	<p>This objective is being met. The auditors observed a large number of raptor nest AOCs on the field audit. Each had been correctly flagged and operations modified in accordance with AOC restrictions. Planning documents detail the specific provision of deer habitat, particularly deer wintering areas.</p> <p>The auditors have noted that the target for red oak renewal on this forest may be too high (Recommendation 10). If this is changed it would be reasonable to review its impact on meeting mast tree targets.</p> <p>One heron rookery was physically inspected. The surrounding AOC had been effectively and generously applied.</p>

		Preferred red shouldered hawk habitat has been modeled using OWHAM. The model shows an increase in this habitat over the 2002-2006 and 2006-2011 terms, from 33,234 ha in 2001 to 42,677 ha in 2011.
<b><i>Objectives for Silviculture, Forest Renewal and Tending</i></b>		
To ensure every forest stand harvested on the Mazinaw-Lanark Management Unit is renewed, and tended as required, by the most appropriate and cost effective methods to achieve the desired future forest condition, more specifically, <ul style="list-style-type: none"> <li>• Even silvicultural expenditure by term within 20% for 100 years</li> <li>• Positive economic return expressed by net present value</li> </ul>	The company prepares very detailed forest operations prescriptions for each harvest block in order to verify stand conditions and apply the most appropriate silvicultural system and silvicultural treatment package in accordance with the silvicultural ground rules. Tree marking is performed by trained and certified tree markers.  No attempts were made to evaluate economic return by net present value other than running SEIM.	This objective is being met, but the auditors have two recommendations that address silviculture. The first (recommendation 10) requires the company and OMNR to reexamine its objectives for red oak regeneration. The company is putting a large effort into this, but results have not been satisfactory. The auditors suggest that the target may not be ecologically sensible in this forest.  The auditors recommend (Recommendation 11) that MLFI consider increasing the use of herbicides on highly productive sites. Herbicides can be a lower cost and effective tool.
To continue to research, test, and implement viable, economical and ecologically-based alternatives for forest renewal and maintenance	Alternatives to herbicide application for site preparation and tending have been employed to the extent that enhanced harvesting and manual cleaning exceeded forecasts while chemical ground site preparation and tending were significantly lower than forecast. No herbicide was applied during the last two years of the term.	As noted above, Recommendation 11 in this audit suggests there is an opportunity to use herbicides effectively. There were sites visited where the alternative techniques used did not appear to be cost effective.  The company does participate in CFS research partnerships. It is not clear how much of that effort is applicable to this unique forest.  Nevertheless, this is an objective with a fairly low target set. The target has been met.

The following table outlines the audit team's assessment of achievement of management objectives from the 2006-2026 FMP. This plan has two years left to complete, so a final statement of achievement would be premature. However, the auditors did not identify any objectives that did not demonstrate satisfactory progress. Auditor comments note where a recommendation in this audit is pertinent to the stated management objectives.

**Table 3. The audit team's assessment of the achievement of management objectives for the 2006-2026 FMP.**

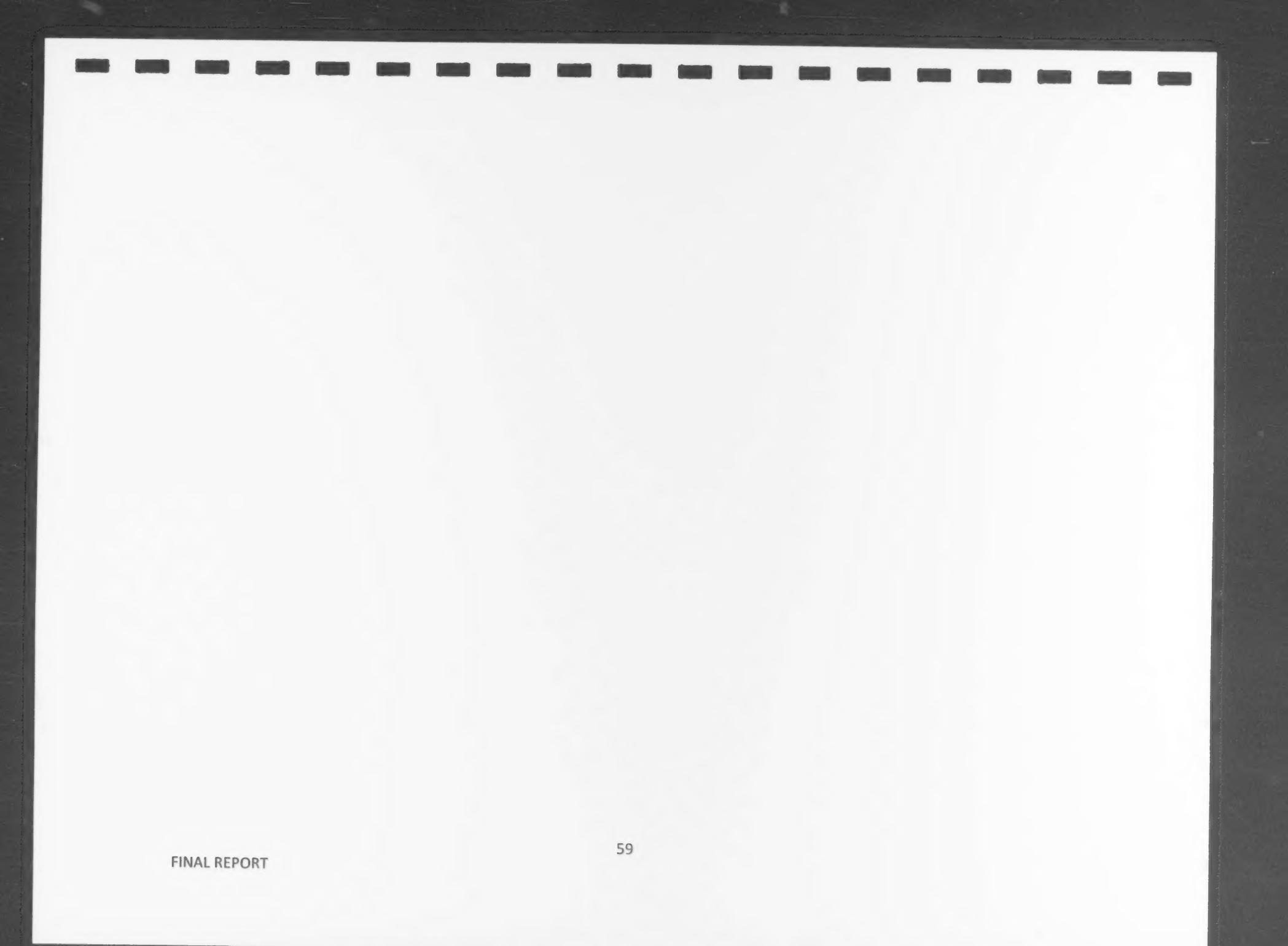
<b>Objectives &amp; Targets</b>	<b>Assessment of Achievement</b>	<b>Auditor Comments</b>
<i>Forest Diversity Objectives</i>		
<i>General Objectives</i>		
Maintain a healthy forest that has species composition, structural elements, and patterns that are representative of the historical landscape of the management unit.  Maintain the diversity of plant species and structural elements within the forest stands while emulating natural patterns and using appropriate silviculture.	The company has included specific targets for white and red pine, red oak, less abundant mid tolerant hardwood species, poplar, white birch, and balsam fir.  Each of these is a species or species complex that is either slightly underrepresented on the current landscape, as compared to what is thought to have been the case with a pre-settlement forest, or in the case of red oak, a condition inherited from the Madawaska Land Use Plan. The rationale and strategies included in the FMP have a very high probability of achievement of the defined targets. Observations in the field showed operational activities were consistent with the objectives and targets.  The forest management prescriptions observed by the auditors showed clear evidence that diversity and structural targets were considered in every operation.	The red oak target listed was converted to a volume target from an area target in the 2001 FMP.  The audit has recommended that the premise for the red oak target be reviewed. The auditors review of the information was not comprehensive, but it seems probable that the target, first defined in the Mazinaw Highlands Land Use Plan, is higher than the normal forest condition should sustain (Recommendation 10).  The auditors have issued Recommendation 9 that OMNR review the applicability of the NDPEG on this forest, largely because it does not apply to the ecologically complex landscape on this forest and the small operational block sizes.  Otherwise, the auditors conclude that this objective is being met.

To conserve the genetic diversity of native forest plant species in the management unit.	This qualitative objective is largely met by the natural regeneration that dominates the silviculture on this forest. Where planting occurs, trees are planted that have been grown from local seed sources. Efforts have been made to promote the regeneration/protection of species at the natural geographic limits of their range through the development of appropriate Forest Operations Prescriptions.	This qualitative objective has been met. There is no apparent threat to the genetic diversity of this forest. The objective has been broadened to include all plant tree species rather than just trees. The strategies presented only speak to tree species though, suggesting the change in objective might have been stretched beyond the real intent.
Old Growth: To ensure that old growth conditions and values are identified and present in the MLF in all forest units at levels that maintain or restore ecological processes, while allowing for sustainable development now and in the future.  Wetlands: To maintain patterns and functions of wetland ecosystems in the MLF.	Old growth targets have been established and SFMM projections indicate they will be met in all terms. Additionally, identified old growth stands have been excluded from timber management activities.  Wetland protection has been accomplished by application of normal AOC prescriptions, and water crossing and road maintenance.  The old growth objective has been expanded in the 2006 plan been broadened to ensure all even aged tree species on the forest, rather than just red and white pine as was the case in the 2001 FMP, within 50% of the natural benchmark level as defined in the null SFMM run.	The objective has been met. There was one water crossing on the forest noted that did not meet the specifications (Recommendation 4). However, this was noted for technical deficiencies in the water crossing, not because it was contributing to a degradation of the stream.  The auditors observed some very effective older water crossings. One in particular would not have met current installation standards, but it withstood a major beaver dam break upstream and allowed very little downstream movement of sedimentation.  The objective is generally more inclusive in its 2006 iteration. The auditors would note that it does not need to be.
<b>Social and Economic Objectives</b>		
<b>Broad Objectives</b>		
Timber production: To provide the forest industry with a continuous, predictable, and efficient supply of forest products while improving the quality of the future timber resource and contributing revenue to	Achieved through implementation of comprehensive FMP.  Achieved by operating the eastern part of the forest	There is ample evidence, largely based on field observations, and an evaluation of long term trends, that the productive and ecological capacity of the forest has been maintained, and that currently

the people of Ontario.	within the objectives set by the Madawaska Highlands Land Use plan.	<p>planned activities will continue to maintain it.</p> <p>The audit has noted a shortfall in regeneration success. The auditors attribute part of this to funding deficiencies, although it is noted that the silviculture on this forest is highly complex. Consequently, accurately predicting response to harvest or silviculture is very challenging on an individual species basis. However, with the exception of red oak sites, and opportunities to improve the effectiveness of regeneration on some clear cut sites with the use of herbicides, the auditors viewed most sites visited as maintaining a productive forest.</p> <p>The actual harvest of timber has never met targeted volumes. This forest has a dedicated volume that is set aside for open market and tendered sales. These are rarely met. There is opportunity to increase the actual harvested volume by 40%, and still be operating within the limits defined by the FMP. It is an opportunity for other users of timber to source raw material, but it is not the obligation of MLFI to find or create the business to do so.</p>
Tourism and Recreation Objective: To contribute to the viability of the tourism industry by protecting tourism values identified during the FMP process.	The strategies include negotiating Resource Stewardship Agreements, following AOC prescriptions, managing access via tertiary road use control, managing forest cover to protect values, and considering aesthetics in FOPs.	<p>No Resource Stewardship agreements have been signed, but none have been initiated by the tourism industry.</p> <p>The FMP process is accommodating the requirements of the tourism industry. They are well represented on the LCC and MLFI have modified operational prescriptions to address concerns about the visual effects of harvest operation on cottage users.</p>

		The objective is being met.
To support and encourage participation of interested aboriginal Communities in the planning of future forest operations to protect aboriginal values and for access to economic benefits derived from the forest.	Achieved by providing economic opportunities from the silvicultural program. A First Nation's contractor was the sole tree planting contractor in 2006-2007. The SFL, OMNR and Sharbot Lake Algonquin First Nations have collaborated to train and certify 5 members of the Sharbot Lake Algonquin Community as tree markers. MLFI will continue to provide access to tree-marking contracts. Further progress is ongoing.	This objective is being partially met, but there is more that can and should be done to encourage participation by the Aboriginal communities. This is the subject of Recommendations 1 and 2.  The company has demonstrated clear intent and performance in protecting Aboriginal values. Page 10 of this report discusses improvements that could increase the effectiveness of the values identification program.
To provide a forest environment that contributes to the cultural heritage interest and spiritual fulfillment of Ontario residents.	The strategies include identifying known cultural heritage sites and applying AOC prescriptions.	The objective is being met. The local residents of the Mazinaw-Lanark area and members of the MLFI show a long term commitment and appreciation of the forest they live in that is expressed through diligent implementation of the FMP, and care for other values in the forest.
<b><i>Provision of Forest Cover for Values Dependent on Forest Cover</i></b>		
White tailed deer: To provide a stable level of habitat for white tailed deer while providing habitat for a broad range of other forest species that depend on similar habitat condition for a component of their needs.	Targets have been identified for wintering areas and for providing mast for the fall range of deer. Notes that deer may actually be overpopulating the forest.	This objective is being met. Operations consider deer yards and other habitat requirements, and protect them either through silvicultural prescription or AOC prescriptions.
Pileated woodpecker: To provide preferred pileated Woodpecker breeding, nesting, foraging, and roosting habitat across the landscape of the MLF.	Application of the Guidelines for Provision of Pileated Woodpecker habitat. Retain cavity and roosting trees. Retain declining poplar as a potential roosting habitat. Continue to identify habitat values through inventory and assessment programs.	This objective is being met through planning and operations.

Red shouldered hawk habitat: To ensure no net loss in the total amount of preferred habitat of red shouldered hawk over the five-year term of the FMP.	Accomplished by applications of AOC prescriptions around identified nest sites, and maintaining mature closed canopy hardwood forests.	Preferred red shouldered hawk habitat has been modeled using OWHAM. The model shows an increase in this habitat over the 2002-2006 and 2006 to 2011 terms, from 33,234 ha in 2001 to 42,677 ha in 2011. Red shouldered hawk population densities continue to improve across their range.
Species at risk: To protect critical and sensitive habitats of species at risk within the MLF, improve information about their occurrence, and increase awareness of potential impacts of forest management practices on species at risk and their habitats.	Accomplished by applications of AOC prescriptions, developing a protocol of reporting species at risk, training and protection of locations.	This objective is being met in terms of protecting known habitat from operational impacts. Audit Recommendation 6 notes a deficiency in the maintenance of confidentiality of locations. Recommendations 3 and 7 reflect administrative confusion on the part of OMNR due to the recent implementation of the Endangered Species Act.
<b><i>Objectives for Silviculture, Forest Renewal and Tending</i></b>		
To ensure every forest stand harvested on the Mazinaw-Lanark Management Unit is renewed, and tended as required, by the most appropriate and cost effective methods to achieve the desired future forest condition.	The company prepares very detailed forest operations prescriptions for each harvest block in order to verify stand conditions and apply the most appropriate silvicultural system and silvicultural treatment package in accordance with the silvicultural ground rules. Tree marking is performed by trained and certified tree markers.  No attempts were made to evaluate economic return by net present value other than running SEIM.	This objective is being partially met. The auditors have two recommendations that address silviculture. The first (Recommendation 10) requires the company and OMNR to reexamine its objectives for red oak regeneration. The company is putting a large effort into this, but results have not been satisfactory. The auditors suggest that the target may not be ecologically sensible in this forest.  The auditors recommend (Recommendation 11) that MLFI consider increasing the use of herbicides on highly productive sites. Herbicides can be a lower cost and effective tool.  The auditors note that the company is behind on its FTG assessment, and have recommended that this effort be improved (Recommendation 15). This recommendation is consistent with that made by the company in its ten year annual report.



FINAL REPORT

### Appendix 3 – Compliance with Contractual Obligations

Licence Condition	Licence Holder Performance
<i>Payment of Forestry Futures and Ontario Crown charges</i>	The company had no outstanding balance as of March 31, 2009. The trust fund minimum balance (\$376,100.00) has been maintained throughout the audit period. As of July 21, MLF overlapping licensees had outstanding balances of \$51,701 against the Consolidated Revenue Fund, \$84,355 against the Forest Renewal Trust Fund and \$26,208 against the Forestry Futures Trust.
<i>Wood supply commitments, MOAs, sharing arrangements, special conditions</i>	There are no wood supply agreements listed in Appendix E of the SFL. The company manages wood distribution provisions in Appendix F of the SFL via internal agreement with MLFI shareholders. They have offered open market wood tendered sale wood as required by their SFL. Uptake of those offerings has been inconsistent.
<i>Preparation of FMP, AWS and reports; abiding by the FMP, and all other requirements of the FMPM and CDSA</i>	FMP, AWS, and annual reports have all been completed as required by the FMPM. Annual reports were not submitted on time, early in the audit term. Performance has improved. A suggestion was made for the MLFI to monitor these submissions.
<i>Conduct inventories, surveys, tests and studies; provision and collection of information in accordance with FIM and in the case of the Agreement in accordance with the Algonquin Forestry Authority Act</i>	The FRI responsibility for inventory has been recalled to the Crown. The company is operating the SFL on a relatively current inventory. There have not been other inventories conducted.
<i>Wasteful practices not to be committed</i>	The company has an effective compliance program in place. Observed non-compliances were consistent with those reported in compliance reports. The audit recommended a procedural improvement to the company's compliance program, by recommending that compliance auditors not be allowed to approve their own reports.

<i>Natural disturbance and salvage SFL conditions must be followed</i>	A blow down area was identified by the SFL. Salvage harvest operations took place.
<i>Protection of the licence area from pest damage, participation in pest control programs</i>	No pest control programs tool place.
<i>Withdrawals from licence area</i>	None noted during the period of this audit.
<i>Audit action plan and status report</i>	The action plan addressed each of the recommendations from the 2004 Independent Forest Audit. The status report (issued January 2009), included a detailed assessment of action undertaken to address each recommendation. Three areas have ongoing activities, or have been noted in this audit as continuing as an issue of concern. The previous audit highlighted values and stream inventory as an issue. The effort to address this is ongoing. A recommendation requiring corporate OMNR to provide funding for values collection has been issued in this audit. Compliance was the subject of six recommendations on the previous audit. One recommendation (recommendation 7 from the previous Independent Forest Audit and recommendation 14 from this report) have been repeated exactly. There has been insufficient action in addressing this issue. Other compliance recommendations from the previous audit are being addressed effectively. Finally, the previous audit identified FTG surveys as being delinquent. This remains an issue on this audit, in spite of evidence confirming improvement.
<i>Payment of forest renewal charges to Forest Renewal Trust</i>	MLFI has met its obligations to the forest renewal trust.
<i>Forest Renewal Trust eligible silviculture work</i>	The auditors inspected 38% of site preparation, 17% of tree planting, 115% of tending, and 15% of FTG sites that were operated on during the five year term of the audit. All work was in accordance with trust fund specifications. A minor deficiency was noted when it was recommended that the company consider increasing its use of herbicides for site preparation or tending. The auditors were required to inspect 20% of

	the sites included in the Forest Renewal Trust Specified Procedures report to confirm the work on the ground was consistent with that charged to the Silvicultural Trust Fund. In total, the audit team viewed 48% of the site preparation sites, 9% of the tree planting sites, 30% of the tending sites and 26% of the FTG sites that were the subject of the Forest Renewal Trust Specified Procedures Report. The audit team found the treatments on the ground were consistent with those charged to the trust fund.
<i>Forest Renewal Trust forest renewal charge analysis</i>	The company FRT Charge analysis was detailed in Appendix 10 of the 2006 FMP and described in section 4.6 and 3.3.3 of the 2006 FMP. Costs ranged from \$35/ha to regenerate forest unit CM1 in a clear cut system to \$905/ha for red oak regeneration in shelterwood system. The costs were largely consistent with the operational expenditures evident on sites inspected, although there was one red oak site inspected where it was evident the regeneration costs would exceed the maximum listed in Appendix 10. Given the success in maintaining the minimum renewal trust fund balance, and the generally successful renewal efforts observed, the renewal charge analysis was determined to be sufficient.
<i>Forest Renewal Trust account minimum balance</i>	The Forest Renewal Trust minimum balance of \$376,100 was maintained throughout the audit period.
<i>Silviculture standards and assessment program</i>	The FTG program was the subject of a second Independent Forest Audit recommendation. The program is technically credible, but it is not meeting FMP targets.
<i>Aboriginal opportunities</i>	This was the subject of two recommendations on this audit. The auditors have not concluded MLFI is in violation of its SFL commitments to work cooperatively with the OMNR and aboriginal communities to identify and implement ways of achieving more equal participation by Aboriginal communities in the benefits from the forest, but additional effort is

	required.
<i>Preparation of compliance plan</i>	This has been effectively addressed.
<i>Internal compliance prevention/education program</i>	An audit recommendation looks to improve the depth of the training program.
<i>Compliance inspections and reporting; compliance with compliance plan</i>	This has been effectively implemented.
<i>SFL forestry operations on mining claims</i>	None observed.
<i>Algonquin Forest Authority maintenance of public access roads</i>	Not applicable.

## **Appendix 4 – Audit Process**

The auditors collected evidence through document review, interviews with staff and stakeholders, and physical inspection of field activities that occurred on the MLF between April 1, 2004 and March 31, 2009. The audit process began with a pre-audit meeting and site selection meeting in Cloyne on July 27, 2009. The purpose of the meeting was for the lead auditor, MLFI, and OMNR to discuss audit logistics and for the lead auditor to collect background information and documents for the audit. Following the meetings, an audit plan was finalized and distributed that outlined the audit schedule and identified the main contacts for the audit.

From August 1 to September 24 the audit team reviewed documents describing forest management activities on the MLF through the audit period. Interviews were held with a variety of interested parties. Personnel from MLF and OMNR were interviewed throughout the audit. Most of these interviews took place in person, but contact by phone and e-mail between the audit team, auditees, and the public was common.

Field site visit locations were selected to evaluate harvest, renewal, tending/maintenance, FTG operations, AOCs, road construction and maintenance, site preparation, water crossings, wildlife management activities, and other areas of special interest. Sites that had multiple audit values (e.g., renewal and AOC) were preferentially selected. Field sites were also selected to ensure that all geographic areas of the MLF were observed and to ensure that evaluations of winter and summer operations were representative of actual operations and included representative sites for the operations of each of the overlapping licensees. On-site and field audit activities occurred between September 14 and October 18.

The audit team verified records and information systems in the MLF and OMNR offices. The team split into two or three field crews at different times, each of which was accompanied by MLF or OMNR staff. Sampling was completed through 14 person days of field inspections. Sampling continued until the auditors had viewed all of the selected sites and were satisfied that they had viewed enough sites to be confident in their assessment of field performance.

Table 4 shows the total amount of each key activity that has occurred on the MLF during the audit period, total area of the sites visited, and the sample size as a percentage of the total area. The protocol requires the audit team to sample a minimum of 10% of the area treated during the audit period, and to increase the sample where higher risk activities were identified (Table 5).

**Table 4 . Sampling intensity of the audit.**

Activity	Total Area in Audit Period (ha)	Total Area Sampled (ha)*	Sample intensity %
Depletion	7495	2065	27
Site Preparation	781	298	38.1
Tree planting	600	104	17.3
Tending	2490	365	14.7
Free to grow	3612	547	15.1
Specified Procedures Sites (Marking)	2018	560	27
Specified Procedures sites (FOP)	2572	1017	39.5
Road Access and Maintenance Agreement sites	521.7 km	330* km	63

\*estimated

**Table 5. Procedures audited by risk category.**

Principle	Procedures Audited, by Risk Category							Comments
	Low Risk			Medium Risk		High Risk		
	Applicable (#)	Selected (#)	% Audited	Applicable (#)	Selected (#)	% Audited	Audited (#) (100% Audited)	
1. Commitment				2	2	1 0 0		All procedures were audited.
2. Public Consultation and Aboriginal Involvement				6	6	1 0 0		All procedures were audited.
3. Forest Management	6	6	1 0	8	8	1 0	57	All procedures were audited.

<b>Planning</b>			0		0		
<b>4. Plan Assessment &amp; Implementation</b>	1	1	1 0 0	1	1	1 0 0	All procedures were audited.
<b>5. System Support</b>				1	1	1 0 0	All procedures were audited.
<b>6. Monitoring</b>				7	7		11 All procedures were audited.
<b>7. Achievement of Management Objectives and Forest Sustainability</b>				2	2	1 0 0	All procedures were audited.
<b>8. Contractual Obligations</b>				4	4	1 0 0	All procedures pertinent to the SFL were audited. Procedures applicable to Crown Management Units were not evaluated.
<b>Totals</b>	7	7		31	31		100

The IFA protocol allows the auditors to subsample procedures identified as low and medium risk in terms of contributions to the sustainability of the forest. Given that the audit team reviewed the content, process or outcome of each of these procedures in their assessment of those procedures deemed high risk, the auditors elected to audit all procedures pertinent to the SFL. As noted above, procedures applicable to Crown Management Units and Algonquin Park were not audited.

#### Area of Concern Site Inspection

The audit team directly examined 66 prescriptions for values protection on the ground including: 25 aquatic sites (Cold Water fisheries, Warm Water fisheries, or Wetlands); 8 AOC crossing installations; 12 nest sites; 3 tourism; 11 special values (deer yards, cultural, other); 7 access related prescriptions (gates, roads, trails). In addition, they reviewed the compliance files for a large number of AOCs, including those which were visited in the field.

In addition, the audit team travelled extensively on the road system in the MLF and observed operational road conditions on primary and secondary roads. In total, the auditors visited 25 sites on the ground, with multiple sub-sites visited within each site.

(c) Summary of consultation and input to audit.

**General Public:** A survey was sent to 800 stakeholders on August 1 using the mailing list that OMNR district maintains for the MLF. The audit team received 38 responses to the survey by mail and nine by email. Additionally, invitations to comment on forest management on the MLF over the audit term were placed in the Ottawa Citizen and 14 regional weekly newspapers. The auditors hosted two open houses on September 16.

**Local Citizens' Committee:** Phone or in-person interviews were held with ten LCC members. This LCC is specific to the MLF. For the period of the audit, the LCC was comprised of a diverse mix of individuals including representatives from: environmental/naturalist organizations, forest products industry, loggers, general public, aboriginal, cottagers, anglers and hunters, prospectors and tourism interests.

**Aboriginal Communities:** Two First Nations and three Algonquin communities were invited to participate in the 2006 FMP. Efforts to consult with all five were undertaken by the audit team.

The two First Nations are the Algonquins of Pikwakanagan and the Mohawks of the Bay of Quinte. A discussion with the forestry manager from Pikwakanagan indicated that the MLF is not of important interest to their community. In discussions with the Mohawks of the Bay of Quinte no interest was expressed in the MLF or any need to discuss to forest management on it.

Meetings were held with several representatives from three Algonquin communities: the Algonquin Nation of Kijicho-Manito (or Bancroft Algonquins); Sharbot Obaadjiwan First Nation (generally situated in the Sharbot Lake area); and, Snimikobi (Beaver Creek) Algonquin First Nation. While the Algonquin communities have interests in numerous forests, the communities of Snimikobi and Sharbot Obaadjiwan indicated that the Mazinaw-Lanark Forest is of primary importance to them. The Algonquins of Kijicho-Manito indicated that the MLF is of secondary interest to them.

**Overlapping Licensees:** Representatives from three overlapping licensees participated in the field visits. All expressed support for the management activities of MLFI and a slightly smaller number were supportive of the work of the OMNR.

**Ontario Ministry of Natural Resources:** The OMNR area foresters, area biologists, and technician participated in the opening and closing meetings of the field audit, as well as the field audit itself. The Bancroft District Manager and Area Supervisor attended the opening and closing meeting, and a field day during the audit. Regional OMNR staff

attended the opening meeting, two days in the field, and the closing meeting. One main office OMNR staff member attended three days of the field audit. The Planning and Information Management Supervisor attended for the opening and closing meeting, as well as one day of the field audit.

**Mazinaw-Lanark Forest Inc.** All staff from MLFI participated in the audit.

## **Appendix 5 – List of Acronyms used**

AHA – Available Harvest Area  
AOC – Area of Concern  
AWS – Annual Work Schedule  
CFSA – Crown Forest Sustainability Act  
FMP – Forest Management Plan  
FMPM – Forest Management Planning Manual  
FOCIS – Forest Operations Compliance Information System  
FRI – Forest Resource Inventory  
FTG – Free-to-grow  
LCC – Local Citizens' Committee  
MLF – Mazinaw Lanark Forest  
MLFI – Mazinaw-Lanark Forest Inc.  
NRVIS – Natural Resources Values Information System  
OMNR – Ontario Ministry of Natural Resources  
RPF – Registered Professional Forester  
RPFO – Report of Past Forest Operations  
SEIM – Social Economic Impact Model  
SFL – Sustainable Forest License  
SFMM – Strategic Forest Management Model  
SGR – Silvicultural Ground Rule

## **Appendix 6 – Audit Team Members and Qualifications**

### ***Craig Howard, R.P.F., CEA (SFM) – Lead Auditor***

**Education:** B.Sc. Forestry, University of New Brunswick, 1983.  
**Experience:** 26 years experience in forestry, 12 years in private practice, 3 years in the OMNR.  
**Previous Audits:** 16 Independent Forest Audits, 11 Sustainable Forest Initiative Verifications, 7 Forest Stewardship Council Assessments.

### ***Mark Leschishin, R.P.F – Forester***

**Education:** B.Sc. Forestry, Lakehead University, 1978. Dip. For. Tech., 1974.  
**Experience:** 28 years experience in forestry in Ontario.  
**Previous Audits:** 12 Independent Forest Audits.

### ***Tom Clark – Ecologist***

**Education:** M.Sc., H.B.Sc.  
**Experience:** Forest ecologist and biologist with 30 years experience in habitat ecology.  
**Previous Audits:** 18 Independent Forest Audits, and numerous Forest Stewardship Council assessments and audits.

### ***Phil Shantz – Socio-economist***

**Education:** M.E.S, R.P.P.  
**Experience:** Registered professional planner with 15 years experience in forest auditing/certification, resource and socio-economics, land-use planning and public consultation.  
**Previous Audits:** 12 Independent Forest Audits, 11 Forest Stewardship Council Assessments.

### ***Brian Callaghan, R.P.F. – Forest Management Planning Analyst***

**Education:** B.Sc.F., University of Toronto, 1982.  
**Experience:** 25 years experience in forestry in Ontario.  
**Previous Audits:** 20 Independent Forest Audits, 12 Sustainable Forest Initiative Verifications, 9 Forest Stewardship Council Assessments.

## **Appendix 7 - Trend Analysis**

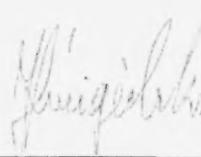
## INDEPENDENT FOREST AUDIT 2009

### COMPARISON AND TREND ANALYSIS OF PLANNED VS. ACTUAL FOREST OPERATIONS

#### LANARK MANAGEMENT UNIT & MAZINAW-LANARK FOREST

August 25, 2009

Prepared by:

  
Jan Smigelski, R.P.F.  
Mazinaw Lanark Forest Inc.

Acknowledgement: Tables 1-6 compiled by Nick Baggs, R.P.F.

Trend Analysis - LANARK

Independent Forest Audit      2009

Comparison and Trend Analysis Of Planned Vs. Actual Forest Operations

Lanark Management Unit & Mazinaw-Lanark Forest

August 25, 2009

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### Introduction

This report has been prepared in accordance with Appendix C of the *Ontario Ministry of Natural Resources Independent Forest Audit Process and Protocol (IFAPP)* Copyright (c) Queens Printer, April, 2004. The Comparison and Trend Analysis (CTA) is intended to summarize and compare planned with actual operations carried out during the five-year term of the current forest management plan (FMP) as well as during the two preceding five-year terms and identify significant trends over time.

The report is intended to support the assessment of forest sustainability and the achievement of management objectives as specifically described in Criteria 7.4 of the IFAPP. Also, in accordance with Appendix C, this report has been prepared with the use of the most recent Report of Past Forest Operations (RPFO) 1998-2001 (Lanark), covering two Contingency Management Plans for the Lanark Crown Management Unit (1998-1999 and 1999-2001) and the Year 10 Annual Report for the Mazinaw-Lanark Forest prepared for the period from April 1, 2005 to March 31, 2006.

Tables 1 to 7 in this report were prepared specifically for the Independent Forest Audit and contain information from the current and previous plans, RPFOs and annual reports while FMP-9 was originally developed for the 2001-2021 FMP for the Mazinaw-Lanark Forest. Planned/actual levels of achievement in Tables 3, 4 & 6 have been annualized to facilitate comparison between terms of unequal duration and the current term for which complete reporting of operations is not yet available. Areas contained in Tables 1 and 5 reflect only the managed Crown land portion of the management unit as defined in the 1996 *Forest Management Planning Manual for Ontario's Crown Forests* (FMPM).

Normally, each CTA five-year term would correspond to the five-year terms of the current FMP and two preceding Timber Management Plans (TMP) and/or Forest Management Plans (FMP). For the Lanark Management Unit (MU), this approach has been modified for two reasons:

- 1) The production of two Contingency Management Plans (CMP)s covering a period of three years from 1998 to 2001, and
- 2) The amalgamation of the Lanark and Mazinaw Management Units in 2001 to create the Mazinaw-Lanark Forest, managed by Mazinaw-Lanark Forest Inc.

As a result of this history, terms for the CTA have been defined on the basis of common strategic direction and land base rather than fixed five-year terms. For example, the 1998-99 CMP shares strategic direction and many common elements, including planned levels, with the 1993-1998 TMP. Therefore, these two plans have been combined to create a six-year term from 1993 to 1999. In contrast, the 1999-2001 CMP utilized entirely different forest units and available harvest area (AHA) was calculated using the *Strategic Forest Management Model* (SFMM) instead of MADCALC. As a result, this plan will be used for the basis of reporting on a two-year term from 1999-2001.

Finally, the 2001-2006 FMP for the Mazinaw-Lanark Forest must be used for as the base for reporting on the current five-year term from 2001-2006. This term is common to both the CTA for the Lanark MU as well as that for the Mazinaw MU, reflecting the amalgamation and common management of these two forests subsequent to 2001.

## Trend Analysis - LANARK

The following table shows the duration of the terms selected for this CTA, the status of completed Annual Reports and the relationship to the corresponding management plans:

**Table A. FMP Terms Used for the Analysis**

Term	Duration in years	Management Plans	Manager
1993-1999	6 (completed)	1993-1998 TMP for the Lanark Management Unit 1998-1999 Cont. Plan for Lanark Crown Management Unit	MNR
1999-2001	2 (completed)	1999-2001 Cont. Plan for Lanark Crown Management Unit	MNR
2001-2006	5 (completed)	2001-2006 FMP for the Mazinaw-Lanark Forest	MLF
2006-2011	5 (2 completed)	2006-2011 FMP for the Mazinaw-Lanark Forest	MLF

The 1993-1998 Timber Management Plan for the Lanark Crown Management Unit, prepared by MNR, is the only plan in this CTA prepared under the 1986 *Timber Management Planning Manual for Crown Lands in Ontario* (TMPM). The 1998-1999 and 1999-2001 Contingency Plans, also prepared by MNR, were written using the FMPM (1996). More recently, the 2001-2006 and 2006-2011 Forest Management Plans for the Mazinaw-Lanark Forest prepared by Mazinaw-Lanark Forest Inc. were also developed in accordance with the FMPM (1996).

Because of fact that two of the four terms used as a basis for this report (1993-1999 and 1999-2001) were already analyzed in the previous CTA in 2004 and the remaining two terms (2001-2006 and 2006-2011) are analyzed in the CTA 2009 for the Mazinaw MU prepared in parallel with this report, in order to avoid redundancy it is necessary to consider this report in conjunction with the Mazinaw CTA 2009. Several references to the Lanark CTA 2004 and Mazinaw CTA 2009 are made in this report to avoid unnecessary repetition of identical content.

### Summary of Total Area Under Management

Table 1 summarizes the Total Area Under Management for the current term and three preceding terms. Land type areas are for Managed Crown land only. Tables from the 1993-1998 Lanark TMP and the 1999-2001 CMP for the Lanark MU were used to define the Lanark land base under management at the beginning of each CTA term while the tables from 2001-2006 and 2006-2011 FMP for the Mazinaw-Lanark Forest were used for the amalgamated land base. Since twelve specified working groups were used in Table 1 to summarize the area of production forest, it was necessary to combine some of the working group areas shown in Tables TMPM 4.8.2, TMPM 4.9, FMP-1 & FMP-2 from the various management plans. Direct comparison of the 2001-2006 term and the current term with past terms is not possible since the total area under management for the past terms is from the former Lanark MU only while the latter two terms are from the amalgamated Mazinaw-Lanark Forest.

The area of former Lanark Crown MU accounts for 10% of the amalgamated Mazinaw-Lanark Forest.

Forest Resource Inventory (FRI) for Lanark Crown MU was updated (replaced) for the 1999-2001 CMP based on aerial photography 1991, using enhanced photo-interpretation standards, later also adopted for the most part in the interpretation of the Mazinaw 1997 photography. In addition to new standards, the production of the inventory was also automated, which introduced a different level of precision and discrepancies when compared to the previous paper map based inventory used for the 1993-1999 term. Consequently Table 1 represents a summary of four separate and independently created sets of FRI data with progressive operational updates, based on the following dates of photography: Lanark 1978 used for 1993-1999 term, Lanark 1991 used for 1999-2001 term and later blended with Mazinaw 1978 data for 2001-2006 term and Mazinaw 1997 blended with Lanark 1991 data and used for 2006-2011 term. It is logical to expect that all these circumstances resulted in various shifts in the area summary figures presented in Table 1 in addition to the actual operations and natural changes on the ground.

## Trend Analysis - LANARK

Table 1 indicates a decrease in the total production forest area between 1993 and 1999 (before amalgamation of management units) by 708 ha or 3.9%. The most likely causes of the decrease include enhanced FRI standards with improved precision due to data automation, ownership updates, natural processes on the landscape (such as flooding) and the exclusion of provincially significant Areas of Natural and Scientific Interest (ANSIs) in accordance with the Madawaska Highlands Land Use Plan (Darling Lake ANSI).

Table 1 also reveals that the area classified as B&S before amalgamation accounted for only 2.9% in 1993 and dropped further to 1% in 1999. This relatively low proportion is attributed primarily to the nature of the forest, characterized by a very diverse mixed species and multi-storey composition with high component of tolerant hardwoods and white pine, which lends itself mostly to partial harvesting systems and continuous maintenance of canopy. The decrease of B&S area over time can be explained primarily by the natural process of canopy closure on undisturbed areas previously classified as B&S, regeneration activities on harvested areas and, potentially, the influence of new FRI data standards and automation.

The comparison of production forest area by working group over time prior to amalgamation shows fairly stable picture that does not raise any particular concern. The 410 ha (9%) drop in Mh working group is offset by 575 ha (10%) increase in the H working group, which seems consistent with the similar trend presented in the Mazinaw CTA and can be attributed to re-grouping of species and new FRI standards.

As explained in the CTA 2004, the dramatic increase in non-forested land between 1993 and 1999 is a result of improper coding of patent UCL land as Crown UCL land in the inventory, the error that was later corrected for the amalgamated Mazinaw-Lanark Forest.

Comprehensive discussion of the changes involving the amalgamated Mazinaw-Lanark land base is presented in the Mazinaw CTA 2009 prepared in parallel with this report.

**Table 2** describes the forest units used in the various management plans for the current term and the preceding three terms and lists the silvicultural systems employed in their management. It also shows the relationship between forest units and defined working groups from Table 1. Reference to related site types and detailed FRI parameters and classification criteria are provided where such information was used to differentiate forest units. Additional comments are also provided to place forest units within the proper management context. Forest units were generally modified with the production of each subsequent plan therefore it was necessary to list them for each distinct term. However, it was possible to combine reference to forest units for the 1993-1999 terms since they were essentially unchanged between the 1993-1998 TMP and the 1998-1999 CMP.

**Table 5** is intended to summarize the managed productive forest area by forest unit for each of the CTA terms. Since table FMP-9 from the 2001-2006 FMP and 2006-2011 FMP for the Mazinaw-Lanark Forest contains the same information required to complete IFA Table 5, therefore two tables FMP-9 are provided in place of Table 5 for both terms. However, FMP-9 areas from the 1999-2001 CMP were not easily copied into IFA Table 5 format since volume and stage of management information were lacking. Therefore, Table 5a summarizes productive forest area by forest unit for the 1999-2001 term only. In contrast, Tables 4.8.2 & 4.9 from the 1993-1998 TMPs provide even less information to complete Table 5. Moreover, this information is summarized by working group instead of forest unit. Accordingly, Table 5 has been modified with the result that Table 5b summarizes area information for the 1993 to 1999 term.

Although direct comparison between forest units for all four terms is impossible because of major changes in the formulation of forest units between 1993 and 2001 it can be observed that refinement between 1993 (summary by working group in place of forest units) and 1999 was aimed at improving silvicultural decision process and potentially future monitoring. The original area in 1993 split approximately evenly between M (maple) and OH working groups (5,119 and 5,620 ha respectively) was replaced in 1999 by 7,928 ha of either HDSEL or HDUS forest units designed for tolerant hardwood management and 3,993 ha of either OR1 or OR2 forest units designed primarily for red oak management, indicating more focused attention on suitability of some areas for oak management.

## Trend Analysis - LANARK

The unavoidable replacement of Lanark forest units with the new Mazinaw-Lanark forest units in 2001 effectively prevents any further comparison between pre- and post-amalgamation areas.

Since age is an important attribute used to describe forest condition, Table B is provided below to highlight the changes in the age class distribution over time. The age structure is summarized across all forest units to demonstrate the relative change in the proportion of total production forest by age class through all four CTA terms. Lanark columns are transcribed directly from the Lanark CTA 2004 and presented alongside the Mazinaw-Lanark data from the Mazinaw CTA 2009 for reference. The focus of comparison is placed on Lanark prior to amalgamation.

**Table B**  
**Percentage of Total Production Forest by Age Class Over Time.**

Age Class	Percentage of Total Production Forest by Age Class (%)			
	1993 Lanark Table 5b	1999 Lanark Table 5a ←decrease      increase→ relative to 1993	Mazinaw- Lanark 2001 Table FMP-9	Mazinaw- Lanark 2006 Table FMP-9
0-20 (incl. B&S/NSR)	3.8%	1.8%	5.9%	2.5%
21 - 40	1.6	1.1	0.9%	1.9%
41 - 60	12.0	8.0	4.4%	10.1%
61 - 80	47.1	31.5	28.7%	27.2%
81 - 100	32.3	46.3	29.4%	23.0%
101 - 120	2.5	10.0	6.3%	6.0%
121 +	0.7%	1.3	0.9%	2.0%
All-age	-	-	23.5%	27.3%
Total	100%	100%	100%	100%

Table B shows a general shift to older age classes, most evident by the decrease in the younger age classes and the increase in the 81-100 age class and older. This trend seems to be even more pronounced than in the Mazinaw Unit. The comparison of the tables between both management units also seems to indicate that on average the Lanark portion of the forest is older than Mazinaw portion, although the use of the all-age category for forest units managed under selection system in Table FMP-9 for 2001-2006 and 2006-2011 terms and the absence of this category in Tables 5a and 5b does not allow for full verification of this conclusion.

More comprehensive discussion of the trends involving the amalgamated Mazinaw-Lanark land base is presented in the Mazinaw CTA 2009 prepared in parallel with this report.

### Summary of Planned and Actual Harvest Volumes

**Table 3** summarizes planned and actual harvest volumes for each of the four terms of the analysis. Planned and actual levels of achievement have been annualized to facilitate comparison between terms. Volumes are shown by species, with the use of upland hardwood (UH) and lowland hardwood (LH) groupings to facilitate comparison of past terms with the current term.

Planned harvest volumes were derived using TMPM Tables 4.17 and/or 4.18.1 from the 1993-1998 TMP. Similarly Tables FMP-21 were used to derive planned harvest volumes for all three remaining terms. Tables RPFO-4 (1993-1998 & 1998-1999) were used to report harvest volumes for the 1993-1999 term while table RPFO-4 (1999-2001) was used to report volumes for the 1999-2001 term. To report actual harvest volumes for the remaining two terms, Table AR-4 from Year 10 AR was used for the Mazinaw-Lanark 2001-2006 term and tables AR-4 (2006-07 and 2007-08) were used to report harvest volumes for the first two years of the current term.

## Trend Analysis - LANARK

Volume for several species was lumped together in the species group labeled OH in order to facilitate broader comparison and to reduce the impact of various changes and inconsistencies between breakdown of species in the forecast for different terms and in the summaries from the Provincial Billing and Scaling System (currently known as TREES). For example soft maple (Ms) is listed in the scaling summaries together with Mh but in the forecasts it was treated variably as first combined with Mh in 1993-1999 and 1999-2001, then lumped with lowland hardwoods in 2001-2006 and with upland hardwoods in 2006-2011. On the forecast side oak and Ms are the two major components of the OH category.

Tables C and D are presented below to throw additional light on potential trends that may not be readily discernible from Tables 3 and 4.

**TABLE C Proportion of Actual Harvest Volume Relative to Forecast Volume by Species**

Species	Actual harvest volume as percentage of forecast volume [%]				Weighted average percentage for all terms [%]
	Past Plans			Current	
	1993 - 1999	1999 - 2001	2001 - 2006	2006 - 2011	
Pw	47%	44%	90%	47%	62%
Pr	62%	1%	95%	87%	88%
Sw	40%	16%	26%	33%	30%
He	0%	4%	33%	41%	35%
Bf	15%	206%	11%	6%	9%
Ce	2%	1%	26%	15%	11%
La			112%	0%	85%
Po	59%	175%	53%	58%	58%
Bw	28%	81%	51%	59%	54%
Mh	100%	94%	120%	161%	133%
OH	36%	29%	50%	69%	52%
Total	51%	61%	67%	69%	66%

**TABLE D Actual Harvest Volume Relative to Forecast Harvest Volume, Yield and Actual Harvest Area over Time for the Lanark MU and Mazinaw-Lanark Forest.**

Term	Actual harvest area as % of planned area [%]	Actual harvest volume as % of planned volume [%]	Forecast yield [m <sup>3</sup> / ha]	Actual yield [m <sup>3</sup> / ha]
1993 - 1999	52%	51%	75.9	73.7
1999 - 2001	62%	61%	50.8	49.7
2001 - 2006	60%	59%	65.1	64.0
2006 - 2011	52%	66%	61.2	72.1

In addition to the findings of the CTA 2004, which already included the Lanark terms 1993-1999 and 1999-2001 the following observations can be offered:

The overall volume and area harvest rates for Lanark MU during 1993 to 2001 were approximately the same as for the Mazinaw MU for comparable period (1996-2001) and fluctuate around 60% of forecast level. The same general level has continued in the more recent terms within amalgamated Mazinaw-Lanark Forest. This pattern cannot be explained by any single or immediately detectable factor. Instead a wide array of issues contributes to the trend as elaborated in the more comprehensive discussion involving the amalgamated Mazinaw-Lanark land base presented in the Mazinaw CTA 2009 prepared in parallel with this report.

When Table C from the Mazinaw CTA 2009 is compared with Table C presented above the pattern of harvest levels in the Lanark MU appears slightly different than in the Mazinaw MU. Although high harvest level for Mh was similar on both parts of the forest, the Pw, Po and OH levels were lower on Lanark than Mazinaw side. This, as suggested in the Lanark CTA 2004, may have more to do with inflated forecast than the actual standards of utilization. It is worth a note, however, that harvesting on Lanark side has

## Trend Analysis - LANARK

been traditionally more closely affiliated with two specific licence holding sawmills while on the Mazinaw side larger portion of harvest has been traditionally carried out by a number of independent licensees with varied and changing market base.

### Summary of Planned and Actual Harvest Area

**Table 4** summarizes planned and actual harvest areas for the current term and three preceding terms. Planned and actual levels of achievement have been annualized. Harvest areas are shown for each term by forest unit corresponding to those described in Table 2.

Planned harvest areas were derived using TMPM Table 4.15 from 1993-1998 TMP for that term while Tables FMP-18 were used to derive planned areas for the 1999-2001 Lanark CMP as well as 2001-2006 and 2006-2011 Mazinaw-Lanark FMP terms.

To report actual depletion areas Tables RPFO-1 (1993-1998 & 1998-1999) were used for the 1993-1999 term, table RPFO-1 (1999-2001) was used for the 1999-2001 term while Table AR-1 from Year 10 AR was used for the Mazinaw-Lanark 2001-2006 term and tables AR-1 (2006-07 and 2007-08) were used to report harvest areas for the first two years of the current term.

In order to maintain consistency in the presentation of data the actual depletion area figures presented in Table 4 for the 2001-2006 term include salvage area identical to Table 4 in the Mazinaw CTA, however it needs to be stated that these figures do not apply to the Lanark part of the forest, since the salvage of blowdown material occurred entirely on Mazinaw side.

Much of the analysis of harvest volumes already discusses harvest area and is equally applicable in this section because of a direct link between the two components, therefore repetition would be redundant.

Overall harvest rates increased from 52% in 1993-1999 term to 62% in 1999-2001 term, very close to the corresponding volume harvest levels and similar to Mazinaw part for the 1996-2001 term (60%).

The level of harvest by forest unit, expressed at the margin of Table 4 as percentage of actual harvest in relation to planned area (3-term average) does not reveal any obvious new pattern and cannot be meaningfully compared to Mazinaw because of different forest units and very small area involved.

Actual harvest area presented in Table 4 on Lanark MU for the 1993-2001 period represents approximately 13% of the total actual harvest from the amalgamated Mazinaw-Lanark Forest for the 2001-2008 period. This proportion is higher than approximately 10% of the production forest represented by the Lanark portion in the amalgamated Mazinaw-Lanark Forest as shown in Table 1. The analysis of the production forest available for timber management in the 2006-2011 Mazinaw-Lanark FMP indicates that the Lanark portion represents 12% of the total available area, however the area selected for harvest for the 2006-2011 term on the Lanark portion of the land base currently represents 16% of the total area selected for harvest. While these differences may reflect the variation in the forest composition on the two parts of the MU (e.g. age structure and proportion of clearcut forest units), it seems advisable to consider the findings in the course of future selection of harvest area.

### Summary of Renewal and Maintenance

**Table 6** summarizes planned and actual renewal, tending and protection operations for the current term and three preceding terms. Planned and actual levels of achievement have been annualized to facilitate comparison between terms of unequal duration and the current term for which complete reporting of operations is not yet available. Areas are shown for each activity and are summarized for un-even aged & even-aged management, natural & artificial regeneration, site preparation, tending and protection.

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Planned renewal areas were derived using TMPM Table 4.19 from the 1993-1998 TMP for the 1993-1999 term. Similarly Table FMP-25 from the 1999-2001 CMP was used to derive planned areas for the 1999-2001 term while Tables FMP-25 from the Mazinaw-Lanark FMP 2001-2006 and 2006-2011 were used for the corresponding two terms. Tables RPFO-7 (1993-1998 & 1998-1999) were used to report areas for the 1993-1999 term. Similarly, Table RPFO-7 (1999-2001) was used to report areas for the 1999-2001 term. Finally, Table AR-7 from the Mazinaw-Lanark Year 10 AR was used for the 2001-2006 term and to-date values from Table AR-7 for the year 2007-08 were used to report renewal areas for the current term.

Clarification: identical to Mazinaw CTA, presentation of *actual* site preparation figures in Table 6 for the 2001-2006 term is modified from the figures presented in AR-7 in Year 10 Report. Table 6 shows separate annualized figures for Mechanical treatment (167 ha) and Enhanced Harvest (120.4), whereas AR-7 shows only one figure for mechanical treatment (1,436 ha). The two figures in Table 6 still add up to the same total as AR-7 (287.2 ha/yr \*5 = 1,436 ha) but they are split based on actual proportion of two treatments as applied on the ground. This is done to disentangle the reporting of "enhanced harvesting" operations (not originally forecast in Table FMP-25) in addition to traditional mechanical treatment under Site Preparation category.

Table 6 has also been expanded to present a 4-term average percentage of actual treatment in relation to planned area, shown at the margin.

Similar to the trend on Mazinaw side of the MU and on Mazinaw-Lanark Forest combined achievement in all major categories is below forecast. The direct analysis of figures for the first two terms (1993-1999 and 1999-2001) was already presented in Lanark CTA 2004, while the broader analysis of Mazinaw-Lanark terms is included in Mazinaw CTA 2009.

In the context of the current report additional insight may be gained by comparing relative extent of various operations on the Lanark MU prior to amalgamation (1993-2001) with the same operations on the Mazinaw side also prior to amalgamation (1996-2001), recognizing major difference in the size of both parts. The general assumption is made that the available land base and the harvest level on Lanark side represented approximately 12% of Mazinaw MU.

Closer scrutiny of Table 6 and Table 4 reveals a trend that characterizes the overall management of Lanark MU before amalgamation.

- Artificial regeneration by tree planting was applied on 16% to 20% of the total harvested area (actual tree planting area relative to actual total harvest). By extending the view back in time this proportion was as high as 25% in 1988-1993 term. This is essentially two times higher than in Mazinaw (see Mazinaw CTA).
- Selection (uneven-aged) management for the same time horizon reaching back to 1988-1993 term shows the declining trend from 42% in 1988-1993 to 37% in 1993-1998 and 23% in 1999-2001 term. This appears to be a slightly lower proportion than in Mazinaw for comparable period 1990-2001.
- The balance of harvest area, i.e. 33%-47% was managed for natural regeneration under shelterwood system in various stages of management, including commercial thinning, and clearcut area, which is comparable with 40-60% on Mazinaw MU during 1990-2001 period.

Looking at the relationship of actual achievement relative to the forecast for the review period of this report the achievement level of Total Regeneration on Lanark MU was lower than on the Mazinaw side (38% & 32% in Lanark compared with 68% in Mazinaw). In addition to the explanation in Lanark CTA 2004 this may be also attributed to different reporting methods with regard to various silvicultural systems and stages of management. However tree planting, while also showing lower achievement level relative to forecast (26% & 30% in Lanark compared with 47% in Mazinaw), appears to have been carried out on relatively larger proportion of harvest area than in Mazinaw, as presented in the previous paragraph. Similar conclusion can be reached for tending in general (area of 74.1 ha & 147.4 ha compared with 560.6 ha) including pre-commercial thinning and spacing under even-aged management (25.5 ha & 74.7 ha compared with 129 ha), although stand improvement in uneven-aged category shows the opposite trend (2.7 ha & 5.4 ha compared with 297.2 ha). Manual cleaning, arguably the most expensive treatment

## Trend Analysis - LANARK

category, shows relatively comparable results between the two MU's (25.7 ha & 7.3 ha in Lanark compared with 134.4 ha in Mazinaw).

The interpretation of the above analysis has to be exercised with caution because of numerous variables contributing to the results, however it seems to indicate slightly more intensive silviculture traditionally practiced on Lanark side compared with Mazinaw, which may reflect the benefits of smaller management unit with relatively high level of funding and possibly subtle differences in management philosophy.

It is relevant to note that the 60 ha annual area of prescribed burning (PB) shown in Table 6 under tending for the term 1999-2001 (in addition to 17.8 ha for site preparation in the previous term) includes the last effectively implemented PB on Mazinaw-Lanark Forest in spring 2000. All PB's shown in Table 6 were carried out in support of red oak regeneration and reflect the interest, commitment and expertise developed in Lanark with regard to oak management. Since that time, despite continued interest, PB treatment became practically unavailable because of the cost and formal constraints.

The cost of silvicultural treatments on Lanark MU for the pre-amalgamation terms is difficult to calculate because of the format of available data that does not match both terms of this review and the expenditure reporting rules during the transitional years of joint management by Mazinaw-Lanark Forest Inc. and MNR. The calculation for the term 1999-2001 using the data from RPFO-11 for that term (annual average expenditure \$69,676) and volume from Table 3 for the corresponding term (8,741.3 m<sup>3</sup>) results in the total cost of \$7.97/m<sup>3</sup>, much higher than the cost on Mazinaw MU. If the funding from Forestry Futures Trust is subtracted (64% of the total expenditure), the net cost derived from Special Purpose Account is \$2.89/m<sup>3</sup>, in line with corresponding value on Mazinaw MU for the 1996-2001 term.

### Summary of Regeneration Assessment

Table 7 provides a summary of harvested area successfully regenerated for all forest units combined as a portion of total area harvested between 1993 and 2001. This review period has been selected to achieve two objectives:

- 1) to maintain continuity with the time frame applied in the previous Lanark CTA in 2004, which evaluated the period from 1988 to 1993, and
- 2) to close the review period in line with Mazinaw CTA at the end of separate accounting for Mazinaw and Lanark MU while coinciding with the beginning of amalgamated forest management planning and reporting, which commenced on April 1, 2001 with the Mazinaw-Lanark FMP 2001-2006. This will allow for moving forward in the future analyses starting at the most logical date.

The time lag of 7 to 15 years between the original year of harvest (1993 to 2001) and the latest potential date of regeneration assessment (2008) provides sufficient time for majority of harvested areas to be assessed for regeneration success. This harvest period also corresponds with the 1993-1999 and 1999-2001 CTA terms referenced throughout this report, facilitating comparison of regeneration success with other identified trends.

The area harvested from 1993 to 1998 was obtained from Annual Report 1997-98 for Lanark MU, table AR-1 and AR-2 (*to-date* numbers); area harvested during the additional year 1998-99 was derived from table RPFO-3 (RPFO 1998-2001) and the area harvested from 1999 to 2001 was obtained from Annual Report 2000-2001 for Lanark MU, table AR-1 (*to-date* numbers). The area harvested under even-aged management presented in Table 7 shows *assessable* area only, which includes all clearcut and all shelterwood seed cut but does not include preparatory cut, various removal cut stages and commercial thinning. By including only the type of harvest that under current standards, and even more so under previous standards, requires formal regeneration assessments and therefore was targeted for assessments, the analysis is narrowed down to comparable figures only. For reference the entire area of even-aged harvest (all clearcut and all shelterwood harvest regardless of stage of management) is presented in a box on the right hand side of the table. The difference of 235 ha, not regarded as *assessable*, includes 108 ha (45%) of removal cut and 127 ha (55%) of preparatory cut, commercial thinning and area classified as group selection. Clearcut harvest for the 8-year period was reported on

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136 ha, representing 10% of the total harvest on Lanark MU and 21% of the assessable even-aged area. This leaves 79% of the assessable even-aged area in shelterwood seed cut category. The entire area reported as selection harvest for the 8-year period is presented as assessable based on current standards, although traditionally selection harvest did not require assessments.

The extent of this eight-year harvest area that was surveyed for regeneration success was determined by reviewing actual survey records from 2002 to 2008. In the absence of surveys reported in AR 1998, 1999 and 2000 and the status of survey records carried out by Mazinaw-Lanark Forest Inc. between 1999 and 2002 it was concluded that the only suitable assessments relevant for the review period 1993 to 2001 are those conducted by Mazinaw-Lanark Forest Inc. in 2002 and later, up to March 31, 2009. This is the only section of CTA where actual results are used from year 3 of the current FMP because the data from the assessments carried out during the 2008-09 year was available in time for preparation of the report.

58.5% of harvest area in Table 7 is classified as even-aged management and 41% as uneven-aged management (637 ha and 440 ha respectively). Of the surveyed even-aged area 58.5% was declared successfully regenerated while 89.7% of uneven-aged area met the selection management standards. The results, particularly for the even-aged portion, appear to reflect more on the formal aspects of the process than on forest development on the ground. To reach this conclusion several factors were considered, most notably the evolution of standards and the nature of Mazinaw-Lanark Forest itself.

Until the implementation of the Silvicultural Effectiveness Monitoring Manual for Ontario (SEM MO) in 2001 the standards defining what areas should undergo free-to-grow assessments in Lanark were preoccupied with areas treated for regeneration of Pw and oak, as reflected by the past assessment commitments. To illustrate this point the Forecast of FTG Assessment in the Lanark TMP 1993-1998 included 686 ha scheduled for assessments (all in the Pw and oak WG), which represented 62% of the actual harvest area reported for the preceding term 1988-1993. The assessments were actually carried out on 281 ha, of which 82% was in the treated (planted) Pw working group category. Similar to Mazinaw, these numbers reflect the fact that prior to 2001 there was no standard that would automatically qualify all prior harvest for regeneration assessments, while selection harvest was entirely outside the assessment program.

The silvicultural success level of 89.7% for un-even aged management presented in Table 7 is very close to the Mazinaw result and appears satisfactory, although the level of assessment relative to harvest is lower (31% for Lanark vs. 61% for Mazinaw).

The total regeneration success of 58.5% for even-aged management is slightly higher than Mazinaw result and the assessment level relative to harvest is also higher (53% vs. 42%).

Table E, directly comparable with Table E in the Mazinaw CTA, shows the summary of the assessments for even-aged management by target forest units.

**Table E.**  
**Regeneration Status on Assessed Even-aged Harvest Area 1995-2001 by target forest unit.**

Target Forest Unit (general grouping)	Target Forest Units (as reported)	Total Assessed [ha]	Declared Free-To- Grow [ha]	Regen. success (FTG /total)	Silvicult. success (FTG on target /total)	FU as % of total assessed area
Conifer mixed CC	CM1, SP1	3.0	3.0	100%	100%	1%
Hardwood shelt.	TH2, HD4	18.8	18.8	100%	100%	6%
Intolerant Hwd. CC	INT, PB1, PO1	24.0	24.0	100%	50%	7%
Oak shelt.	OH, OR1	99.5	26.2	26%	15%	29%
White Pine shelt.	PN4, PW1	194.7	127.0	65%	56%	57%
<b>Total</b>		<b>340.1</b>	<b>199.0</b>	<b>58.5%</b>	<b>47%</b>	<b>100%</b>
<i>Silvicultural success = also Regeneration success</i>						

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The last column of the table shows that, similar to Mazinaw, the largest portion of the area assessed involves white pine as a target species, followed by oak, which is consistent with high proportion of these forest types in the harvest area during the 1993-2001 period (Table 4). Also similar to Mazinaw Pw represents the largest successfully regenerated area overall. The significant difference between the two former management units is relatively higher proportion of successful oak regeneration on the Lanark side, comprising Peter White block in Darling Twp., potentially one of the most successful managed natural oak regeneration areas in Ontario.

The total of 476 ha of assessments presented in this report pertaining to the harvest that took place between 1993 and 2001 represent 7% of all FTG assessments carried out by the Mazinaw-Lanark Forest Inc. during the data collection period of 2001 – 2009.

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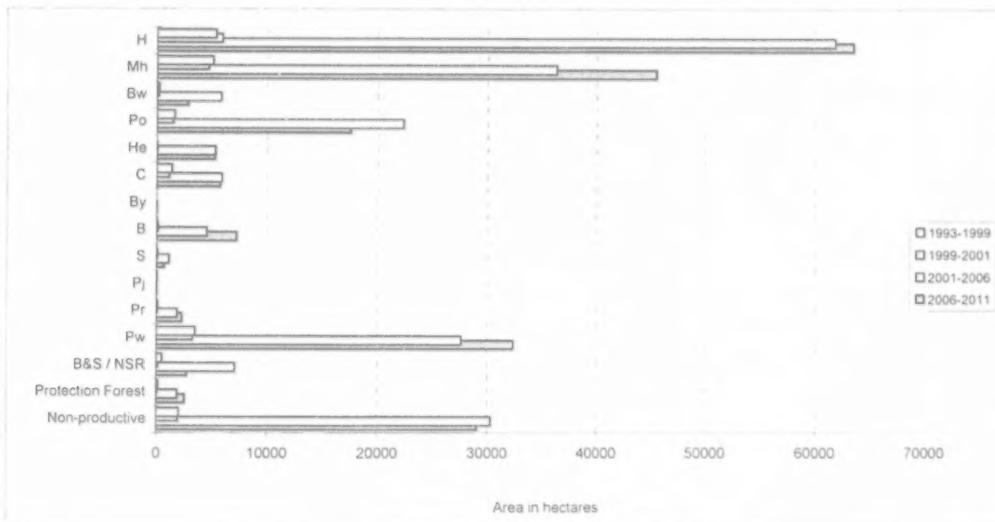
Table 1 - Summary of Total Area Under Management

Past and Current Plans - Crown Managed

MU: Lanark (1993-2001) and Mazinaw-Lanark (2001-2011)

Land Type	Plan Term	Area in hectares			
		Past Plans		Current	
		1993-1999	1999-2001	2001-2006	2006-2011
Non-Forested					
Other Land		562	*14429	4,206	2,419
Forested					
Non-productive		2,063	1,987	30,356	29,100
Productive		18,174	17,396	182,424	189,798
Protection		165	95	1,903	2,591
Production Forest					
B&S		538	173	7,117	2,777
NSR / Depleted					
Working Group	WG included				
Pw	Pw	3,538	3,324	27,639	32,374
Pr	Pr	129	102	1,872	2,314
Pj	Pj+Ps	83	2	41	42
S	Sb+Sw	33	115	1,124	698
B	B	40	127	4,554	7,249
By	By		2	62	53
C	Ce+L+Oc	1,368	1,134	5,933	5,769
He	He	<i>Included in C</i>		55	5,297
Po	Po	1,616	1,470	22,347	17,571
Bw	Bw	207	176	5,856	2,844
Mh	Mh	5,091	4,681	36,342	45,546
H	O+OH+H+Ms+A	5,366	5,941	61,853	63,521
Total Production Forest		18,009	17,301	180,521	187,208
Total Forested Land		20,237	19,383	212,780	218,897

\* Patent UCL improperly classified as Crown UCL in the 1997 FRI (1991 photography)



Source: FMPM FMP - 1 and 2  
TMPM Table - 4.8.2

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Table 2 - DESCRIPTION OF FOREST UNITS (FMP-2)

Forest Unit Code	Name	Forest Type	Silvicultural Group	Silvicultural System	FMS Parameters & Criteria	Additional Information		
<b>Marinaw-Lanark (2006-2011)</b>								
PW1	Pw-PQn-USA	Conifer	White Pine	Ecosystem	11,12,14,20,21,23,27,30 Shelternwood 4-stage	Pw=Pr and Pw=Ha and Pw=S and Pw=P and Pw=Gr and (Pw=Pr> 7 and Stbs> 7)	Stands with high concentration of white pine	
Pw1	Pw/Pt/32	Conifer	White Pine (Red Pine)	Ecosystem	11,12,14,17,18,20,21,22,23, 26,28,29,29,30 Shelternwood 2-stage	Pw=Pr and Pw=Ha and Pw=S and Pw=P and Pw=Gr and Pw=Cx and Pw=Pt and Pw=Pr=Ha < SunQn+Sb+Cs+Pw> 5 and Stbs> 6 or Pw=Pr=Ha < SunQn+Sb+Cs+Pw> 7 or FUn>P1*	Stands with lower concentration of white pine, usually lower stocking than PW1, includes red pine stands	
HL1	HeL/54	Conifer	Hemlock	Ecosystem	23,24,25,26,27,28,30 Shelternwood 4-stage	He> 5	Stands dominated by Hemlock	
GR1	Qn-QnPine-US3	Tolerant	Oak	Ecosystem	14,17,18,19,20,21,22,23,24, 25,26,27,28,29,30 Shelternwood 3-stage	Qn=Pr and Qn=Pr and Qn=Ha and Qn=S and Qn> 3 and Qn=Pr=Ha > SunQn+Sb+Cs+Pw> 6	Stands composed of red oak in sufficient quantity to warrant management for oak	
LH1	Low Hdwd Sel	Tolerant	Ash	Ecosystem	12,13,14,15,19 Shelternwood	Cx+Ls+Sb+Ab> Evn and Ab+Evn+Ms> Yb+Sb+Cx+Ls+BF	Low lying hardwood species found on moist to wet sites	
LC1	All low Com	Conifer	Cedar (Larch)	Ecosystem	16,17,22,23,30,31,32,33,34 Selection	Cx+Ls+Sb+Ab> Evn 5 Mh+Ab+Avn+Bs+Be+Ch+Even+Qn+Yb+Ovn+Cb+He> 5 and Pe+Bev+Bm< 3 and (Sc = 'X' OR Sc = '1') and Pe+Bev+Bm< 3 and (Sc = 'X' OR Sc = '1')	Low lying conifer species found on moist to wet sites	
HD1	Tol Hdwd Sel	Tolerant	Hard Maple	Ecosystem	14,15,16,17,23,24,26,27 28,29,30,35 Selection	Mh+Ab+Avn+Bs+Be+Ch+Even+Qn+Yb+Ovn+Cb+He> 5 and Ag> 80 and Stbs> 6 and Ag> 80 and Stbs> 6	Mature tolerant hardwood on good sites	
HD2	Tol Hdwd Sel	Tolerant	Hard Maple	Ecosystem	14,15,16,17,18,20,23,24,25, 26,27,28,29,30 Shelternwood	Mh+Ab+Avn+Bs+Be+Ch+Even+Qn+Yb+Ovn+Cb+He> 5 and Pe+Bev+Bm< 3 and (Sc = 'X' OR Sc = '1') and (Ag> 80 and Stbs> 6 or Age> 80 and Stbs> 6) and He> 2 and	Younger tolerant hardwood stands that require additional silvicultural work, usually managed for future HD1	
HD4	Qn-Telhd-U33	Tolerant	Hard Maple (Oak, Red Maple)	Ecosystem	14,17,23,24,25,26,27,28,29, 20 Shelternwood 1-stage	Mh+Ab+Avn+Bs+Be+Ch+Even+Qn+Yb+Ovn+Cb+He> 5 and Yb> 4	Tolerant hardwood stands unsuitable for selection management, sometimes poor sites	
CM1	Can UpdL	Conifer	Balsam Fir (White Pine, Cedar)	Ecosystem	11,12,13,15,16,17,18,19, 20,21,22,23,28,30,31 Clearcut	Pw=Pr=Pr> Pw+Sb+SunQn+Ls+Oc+He+BF> 7	Consider mixedwood stands predominately composed of balsam fir, includes spruce stands	
INT	Poplar/Bir	Intolerant	Poplar (White Birch)	Ecosystem	11,12,13,14,16,17,18,19,20, 21,22,23,24,25,26,27,30,34,35 Clearcut	Po+Bm> 8 and Po+Bev+Ms	Stands dominated by poplar and/or white birch	
MW1	Mixed U33	Mixedwood	Red Maple (White Pine, Oak)	All ecosystem except 15, 16 & 31 Shelternwood 1-stage	Pw=Qn+Ha+SunMn> Bm> Avn+Pw+SunQn+Sb+Cs+Pw> 6	Mixedwood stands of extremely variable composition and structure that require flexible silvicultural management		
MW1	Mixed wood	Mixedwood	Red Maple (Poplar, Balsam Fir)	All ecosystem except 15 & 31 Clearcut	everything else	Mixedwood stands not suitable for shelterwood system		
<b>Marinaw-Lanark (2001-2006)</b>								
PW1	Pw-PQn-USA	Conifer	White Pine	Ecosystem	11,12,14,20,21,23,27,30 Shelternwood	Pw=Pr and Pw=Ha and Pw=S and Pw=P and Pw=Gr and (Pw=Pr> 7 and Stbs> 7)	Stands where the main tree species is white pine	
Pw1	Pw/Pt/32	Conifer	White Pine	Ecosystem	11,12,14,17,18,20,21,22,23, 24,26,27,28,29,30 Shelternwood	Pw=Pr and Pw=Ha and Pw=S and Pw=Gr and Pw=Cx and Pw=Pt and Pw=Qn and Pw=BF and Pw=Pr=Ha < SunQn+Sb+Cs+Pw> 3 and Stbs> 6 or Pw=Pr=Ha < SunQn+Sb+Cs+Pw> 7 or FUn>P1*	Stands composed of white and red pine with low stocking	
HL1	HeL/54	Conifer	Hemlock	Ecosystem	23,24,25,26,27,28,30 Shelternwood	He> 5	Stands composed of 50% Hemlock	
GR1	Qn-QnPine-US3	Tolerant	Oak Red-White Hardwood	Ecosystem	14,17,18,19,20,21,22,23,24, 25,26,27,28,29,30,35 Shelternwood	Qn=Pr and Qn=Pr and Qn=Ha and Qn=S and Qn> 3 and Qn=Pr=Ha > SunQn+Sb+Cs+Pw> 6	Stands composed of red oak and oak associated species	
LH1	Low Hdwd Sel	Tolerant	Ash	Ecosystem	12,13,14,15,19 Shelternwood	Cx+Ls+Sb+Ab> Evn and Ab+Evn+Ms> Yb+Sb+Cx+Ls+BF	Low lying hardwood species found on moist to wet sites	
LC1	All low Com	Conifer	Cedar	Ecosystem	16,21,22,30,31,32,33,34 Clearcut	Cx+Ls+Sb+Ab> Evn 5 and Cx+Ls+Sb+Ab> He> 5 Cx+Ls+Sb+8 and Cx+Ls+Sb+BF+Cx	Low lying conifer species found on moist to wet sites	
HD1	Tol Hdwd Sel	Tolerant	Hard Maple	Ecosystem	14,15,16,17,21,24,25,26,27, 28,29,30,35 Selection	Mh+Ab+Avn+Bs+Be+Ch+Even+Qn+Yb+Ovn+Cb+He> 5 and Pe+Bev+Bm< 3 and (Sc = 'X' OR Sc = '1') and and Ag> 80 and Stbs> 6	Mature tolerant hardwoods on good sites	
HD2	Tol Hdwd Sel	Tolerant	Hard Maple	Ecosystem	14,15,16,17,18,20,23,24,25, 26,27,28,29,30 Shelternwood	Mh+Ab+Avn+Bs+Be+Ch+Even+Qn+Yb+Ovn+Cb+He> 5 and Pe+Bev+Bm< 3 and (Sc = 'X' OR Sc = '1' OR Sc = '2') and Ag> 80 and Stbs> 6	Younger tolerant hardwood stands that require silvicultural work (Stand improvement)	
HD4	Qn-Telhd-U33	Tolerant	Hard Maple	Ecosystem	14,17,23,24,25,26,27,28,29, 30 Shelternwood	Mh+Ab+Avn+Bs+Be+Ch+Even+Qn+Yb+Ovn+Cb+He> 5 and Yb> 4	Tolerant hardwood stands on poor sites	
CM1	Can UpdL	Conifer	Elkton/Cedar	Ecosystem	11,12,13,14,15,16,17,18,19, 20,21,22,23,28,30,32,33 Clearcut	Pw=Pr=Pr> Pw+Sb+SunQn+Ls+Oc+He+BF> 7	Consider mixedwood stands predominately composed of balsam fir and spruce	
INT	Poplar/Bir	Intolerant	Poplar	Ecosystem	11,12,13,14,16,17,18,19,20, 21,22,23,24,25,26,27,30,34,35 Clearcut	Po+Bm> 8 and Po+Bev+Ms	Stands composed predominately of poplar and white birch mixed with small amounts of red maple	
MW1	Mixed U33	Mixedwood	Elkton Hardwood	Ecosystem	11,12,13,14,16,17,18,19,20,21, 22,23,24,25,26,27,29,30,32,33,34, 35 Shelternwood	Pw=Qn+Ha+SunMn> Bm> Avn+Pw+SunQn+Sb+Cs+Pw> 6	Mixedwood stands that will be managed under the shelterwood silvicultural system	
MW1	Mixed wood	Mixedwood	Poplar	Ecosystem	11,12,13,14,16,17,18,19,20,21, 22,23,24,25,26,27,28,29,30,32,33,34,35 Clearcut	everything else	Mixedwood stands that will be managed under the clearcut silvicultural system	
<b>Lanark (1999-2001)</b>								
PRP1	PLANTATIONS	Conifer	Pt	Ecosystem	11,12,15,20,21 Clearcut	(FU<~PW 1*) AND (G=Qn>Pw)&(G=(W>Pw))	Red and jack pine plantations	
POMOD	PO-BW-MIX	Intolerant	Hardwood	Pt, Bw	Ecosystem	(FU<~PW 1*) AND (FU<~BW/C*) OR (FU<~UDMC*) AND (Pw> 4)	Stands dominated by trembling aspen and/or white birch, may contain other hardwoods or conifer to a lesser degree	
PW1	WHITE PINE	Conifer	Pt	Ecosystem	11,14,17,18,20,21,22,23,24,25,26,27, 28,29,30 Shelternwood	(W>G>PW 1*) AND (W>G>Pw 1*) AND (Qw> 3) AND (Mh>He)&(Pw>PW>SW 10) OR (Pw> 4)	Stands where the main tree species component is white pine	
RD1	RED OAK SC X 1.2	Tolerant	Hardwood	Ot	Ecosystem	14,23,24,25,26 Shelternwood	(FU<~PW 1*) AND (Qw> 4) AND (ND (SC=X)&OR (SC=X)*) OR (SC=X)*) AND (Qw> 4) AND (Mh>He)	High quality red oak stands found on site class X, 1 & 2
RD2	RED OAK SC 3	Tolerant	Hardwood	Ot	Ecosystem	14,17,23,24,25,26 Shelternwood	(FU<~PW 1*) AND (Pw>Qw 1*) AND (Qw> 4) AND (Mh>He)&(OR (FU<~PW 1*) AND (STYPE>2)) OR (FU<~OLR 1*) AND (Pw> 4) AND (Mh>He)	Lower quality red oak stands found on site class 3
HEUS	MND-LQ HWD	Tolerant	Hardwood	Mh, Bw	Ecosystem	14,23,24,25,26,27,28,29,34 Shelternwood	(FU<~QH 1*)&(FU<~QH 2*)&(FU<~THL 1*) OR (FU<~QH 2*)&(FU<~QH 3*)&(FU<~THL 2*) AND (FU<~QH 3*)&(FU<~QH 4*)&(FU<~THL 3*) AND (FU<~QH 4*)&(FU<~QH 5*)&(FU<~THL 4*)	Even-aged shade tolerant hardwoods of lower quality, predomnantly hard maple/birch
UPMNC	UPE MIXED-WOODS	Conifer	Cx, Sw	Ecosystem	17,18,19,20,21,22,27,14 Clearcut	(FU<~CMIC*)&(FU<~CH 1*) OR (FU<~PW 1*) AND (FU<~PW 1*)	Upaged coniferous stands, predominantly white cedar/white spruce, may contain some aspen	
LMDC	LOW MIXED-WOODS	Conifer	Cx, Ms, Ab	Ecosystem	12,33,34,35 Shelternwood	(FU<~LC 1*)&(FU<~LMCC*)&(FU<~LMSEL*) OR (FU<~LC 2*)&(FU<~LMCC*)&(FU<~LMSEL*)	Low-level conifer and hardwoods, predominantly white cedar and soft maple/ash	
HDSEL	HWD SELECTION	Tolerant	Hardwood	UH, Bw	Ecosystem	(FU<~OMSL 1*) OR (FU<~THSEL 1*) OR (FU<~HUE 1*) OR (FU<~OMSL 2*) OR (FU<~OBUS 2*) OR (FU<~THUS*) OR (FU<~PQU 2*)	All-aged shade tolerant hardwoods such as hard maple/birch, managed with the selection silvicultural system	
<b>Lanark (1999-2000)</b>								
Pw	White Pine	Conifer	Pt		Shelternwood	WG = Pw, all site classes	Mechanical, chemical or prescribed burn SIP to prepare site for natural or artificial regeneration	
HC	Black Cherry	Conifer	C (Pw, Pt, S, Ha)		Clearcut	WG = Cx, Pt, S, & He	Mechanical regeneration described from to prepare site for natural or artificial regeneration	
B	Balsam Fir	Conifer	B		Clearcut	WG = B	Consider conversion to more desirable species on poorer sites	
NbEA	Maple Even Aged	Tolerant	Nb		Shelternwood	WG = Nb (even aged)	Natural regeneration of maple through logging, summer fall logging to promote natural regeneration of oak and basswood	
NbEA	Maple All Aged	Tolerant	Nb		Selection	WG = Nb (mixed aged)	Single tree selection to regenerate shade tolerant species, group selection to regenerate shade tolerant/interior species, summer fall logging to promote natural regeneration of oak and basswood	
OHSCX,1.2	Other Hardwood SC X, 1, 2	Tolerant	H		Shelternwood	WG + OH (SC X, 1, 2)	Natural regeneration of maple through logging, summer fall logging to promote natural regeneration of oak and basswood, consider mechanical, chemical or prescribed burn SIP to promote oak and discourage maple	
OHSCX,1	Other Hardwood SC X, 1	Tolerant	Hardwood		Shelternwood	WG + OH (SC X, 1)	As above, consider conversion to other species on poorer sites	
PwSCX,1.2	Poplar SC X, 1, 2	Intolerant	Pt		Clearcut	WG + Pt (SC X, 1, 2)	Natural regeneration through harvesting, consider scarification or prescribed burn to regenerate	
PwSCX	Poplar SC 3	Intolerant	Hardwood		Clearcut	WG + Pt (SC 3)	Consider conversion to other species on poorer sites	
BwSCX,1	White Birch SC X, 1	Intolerant	Bw		Clearcut	WG + Bw (SC X, 1, 2)	Natural regeneration through harvesting, consider scarification or prescribed burn if appropriate	
BwSCX	White Birch SC 1	Intolerant	Hardwood		Clearcut	WG + Bw (SC 3)	Consider conversion to other species on poorer sites	
Deforestd	Deforestd						Allocated for management of specific values or as encountered in normal harvesting operations	

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**Table 3 - Summary of Planned & Actual Harvest Volumes**  
**MU: Lanark (1993-2001) and Mazinaw-Lanark (2001-2011)**

Average Planned Annual Harvest Volumes

Volumes are Annualized for the indicated period

Species	Volume in cubic metres (m³)			
	Past Plans		Current	
	1993-1999	1999-2001	2001-2006	2006-2011
Pw	3,085	3,096	18,617.7	28,876.2
Pr	59	162	3,321.8	4,828.8
Pj	-	-	-	-
Sb	-	-	-	32.0
Sw	345	121	3,526.0	4,037.2
He	407	52	5,338.9	5,117.4
Bl	752	81	4,051.9	8,844.0
Ce	1,656	252	828.8	1,167.2
La	-	-	5.2	1.6
Po	3,589	1,409	38,981.4	39,509.4
Bw	1,251	480	10,089.3	8,348.6
Mh	5,018	2,588	24,943.3	21,498.8
OH	O, Bd, Be, Oh, By, H, Ir, A, Eir, Mh	6,833	5,975	34,389.1
Total Planned Volumes	22,995.6	14,324.3	142,091.3	143,213.2

Source: Table 27 (4, 18, 1); FMP-21 (1993-1998) (1999-2001) (2001-2006) (2006-2011)  
 RPFO-4

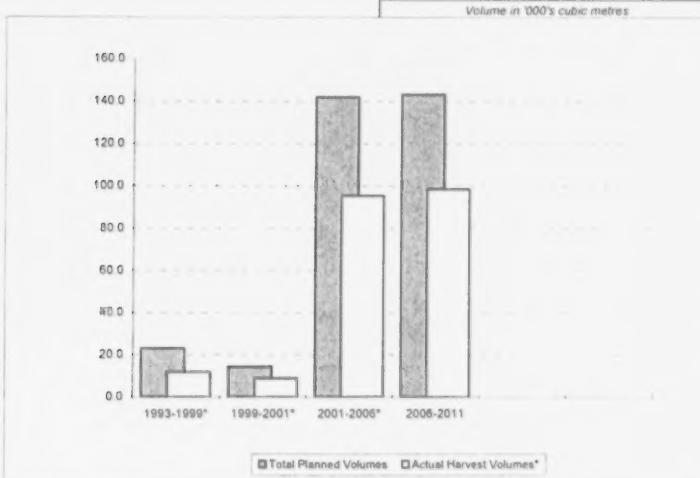
\* Table 26 planned volumes are greater than reported in RPFO-4. Decision made to use Table 26 as the source document.

Actual TREES Harvest Volumes

Volumes are Annualized for the indicated period

Species	Volume in cubic metres (m³)			
	Past Plans		Current	
	1993-1999	1999-2001	2001-2006	2006-2011
Pw	1,441.3	1,377.2	18,815.5	13,539.0
Pr	36.0	1.6	3,146.6	4,028.0
Pj	-	-	-	-
Sb	-	-	-	-
Sw	138.3	19.7	912.1	1,346.0
He	2.0	2.3	1,786.4	2,077.0
Bl	115.5	165.7	451.3	501.0
Ce	34.7	1.5	213.9	176.5
La	-	-	5.8	-
Po	2,132.9	2,630.0	19,750.8	22,873.0
Bw	356.0	386.5	5,135.1	4,928.0
Mh	5,008.7	2,437.5	29,963.4	34,537.0
OH	O, Or, Bd, Be, Oh, By, H, Cb, Br, A, Eir	2,459.6	1,719.5	17,126.8
Total Actual Volumes	11,725.8	8,741.3	95,307.7	98,480.0

Source: RPFO-4 (1993-1998 & 1999-2001) 10 yr AR-4 (2001-2006) (2006-2007 & 2007-2008)



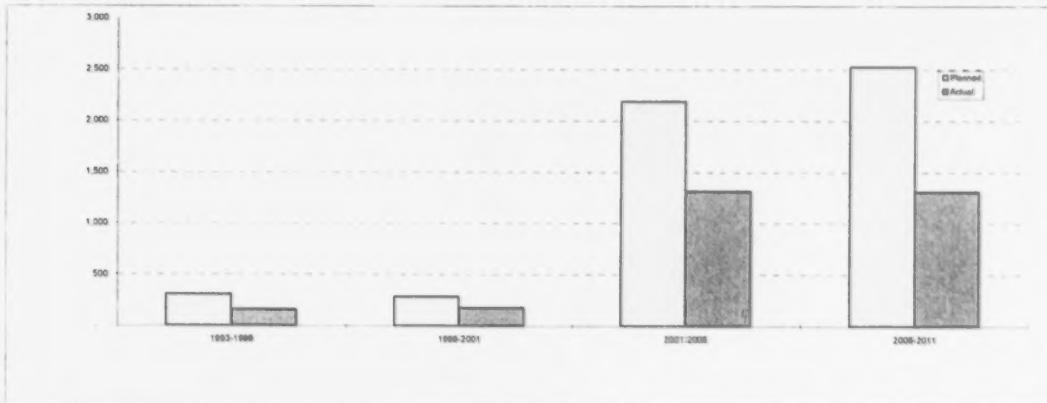
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**Table 4 - Summary of Planned & Actual Depletion Area  
Past and Current Plans**

MU: Lanark (1993-2001) and Maziaw-Lanark (2001-2010)

Area is Annualized for the indicated period

Plan Term	Planned Annual Harvest Area				Actual Depletion Area						3-term avg. vs Planned Harvest %	
	Area in hectares				Area in hectares							
	Past Plans	Current	Past Plans	Current	1993-1999	1999-2001	2001-2006	2006-2011	Harvest	Natural		
Forest Unit	1993-1999	1999-2001	2001-2006	2006-2011	Harvest	Natural	Harvest	Natural	Harvest	Natural		
2006-2011												
PW1					115				71		62%	
Pine1					359				108		30%	
HE1					14				42		295%	
OR1					202				124		61%	
LH1					8				2		20%	
LC1					8				-			
HD1					725				341		47%	
HD2					412				181		37%	
HD4					97				132		136%	
CM1					20				4		21%	
INT					242				101		42%	
MW2					174				135		78%	
MW1					156				96		61%	
									3		52%	
2001-2006												
PW1					48				48		98%	
Pine1					295				180		61%	
HE1					37				5		13%	
OR1					266				148		55%	
LH1					1				0		12%	
LC1					0				0		9%	
HD1					567				385		68%	
HD2					441				232		53%	
HD4					48				43		90%	
CM1					1				0		4%	
INT					109				29		26%	
MW2					127				144		113%	
MW1					244				100		41%	
									28		60%	
1993-1999												
PRJ												
POMD					6				17		310%	
PW 1					52				46		88%	
OR 1					56				48		85%	
OR 2					16				15		98%	
HDUS					22				2		7%	
UPMXC					5				5		55%	
LOM XC					9				43		37%	
HDSEL					117						62%	
Total Area:	363	282	2,184	2,523	189	-	176	-	1,212	242	52%	
Source:	RPF0-1 (1993-1999)	RPF0-1 (1999-2001)	FMP-18 (2001-2006)	FMP-18 (2006-2011)	RPF0-1 (1993-1999)	RPF0-1 (1999-2001)	RPF0-1 (1999-2001)	RPF0-1 (2001-2006)	10yr AR-1 AR-1 (each: year from 2001-2006)	AR-1 (2006-2007 & 2007-2008)	AR-1 (2006-2007 & 2007-2008)	



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**Table 5b - SUMMARY OF MANAGED PRODUCTIVE FOREST BY WORKING GROUP (TMPM 4.8.2 & 4.9)**

MU: Lanark (1993-1999)

Pw	B&S/NSR 1 to 20 21 to 40 41 to 60 61 to 80 81 to 100 101 to 120 121 +					112 87 28 769 1044 1518 60 32
	WG Subtotal	7	0	0	0	1650
Pr	B&S/NSR 1 to 20 21 to 40 41 to 60 61 to 80 81 to 100 101 to 120 121 +					0 44 84 1 0 0 0 0
	WG Subtotal	0	0	0	0	129
Pj	B&S/NSR 1 to 20 21 to 40 41 to 60 61 to 80 81 to 100 101 to 120 121 +					0 0 83 0 0 0 0 0
	WG Subtotal	0	0	0	0	83
Sp	B&S/NSR 1 to 20 21 to 40 41 to 60 61 to 80 81 to 100 101 to 120 121 +					0 0 5 0 9 12 0 7
	WG Subtotal	0	0	0	0	31
B	B&S/NSR 1 to 20 21 to 40 41 to 60 61 to 80 81 to 100 101 to 120 121 +					2 0 0 28 12 0 0 0
	WG Subtotal	0	0	0	0	42
L	B&S/NSR 1 to 20 21 to 40 41 to 60 61 to 80 81 to 100 101 to 120 121 +					2 1 0 0 0 0 0 0
	WG Subtotal	0	0	0	0	2

OC	B&S/NSR					120
	I to 20					0
	21 to 40					0
	41 to 60					15
	61 to 80					809
	81 to 100					428
	101 to 120					60
	121 +					54
	WG Subtotal	2	0	0	0	1486
M	B&S/NSR					28
	I to 20					0
	21 to 40					15
	41 to 60					360
	61 to 80					2402
	81 to 100					1686
	101 to 120					158
	121 +					30
	WG Subtotal	18	0	0	0	5119
Po	B&S/NSR					22
	I to 20					2
	21 to 40					56
	41 to 60					291
	61 to 80					1224
	81 to 100					41
	101 to 120					0
	121 +					0
	WG Subtotal	8	0	0	0	1638
Bw	B&S/NSR					0
	I to 20					0
	21 to 40					4
	41 to 60					38
	61 to 80					158
	81 to 100					7
	101 to 120					0
	121 +					0
	WG Subtotal	4	0	0	0	207
OH	B&S/NSR					254
	I to 20					10
	21 to 40					11
	41 to 60					212
	61 to 80					2836
	81 to 100					2126
	101 to 120					177
	121 +					0
	WG Subtotal	126	0	0	0	5620
ALL		0	0	0	0	0
	B&S/NSR	0	0	0	0	540
	I to 20	0	0	0	0	143
	21 to 40	0	0	0	0	286
	41 to 60	0	0	0	0	2154
	61 to 80	0	0	0	0	8488
	81 to 100	0	0	0	0	5820
	101 to 120	0	0	0	0	455
	121 +	0	0	0	0	123
	Total	165	0	0	0	18009

**Source:** TMM table 48.2 & 49 (1993-1998)

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**Table 5a - SUMMARY OF MANAGED PRODUCTIVE FOREST BY FOREST UNIT (FMP-9)**

MU: Lanark (1999-2001)

Forest Unit	Age Class	Protection Forest		Production Forest				Forest Unit	Age Class	Protection Forest		Production Forest					
		Unavailable		Stage of Mgmt		Available				Unavailable		Stage of Mgmt		Available			
		(ha)	(m <sup>3</sup> )	(ha)	(m <sup>3</sup> )	(ha)	(m <sup>3</sup> )			(ha)	(m <sup>3</sup> )	(ha)	(m <sup>3</sup> )	(ha)	(m <sup>3</sup> )		
PRPJ	1 to 20			2.3		10.3	35.4							25.7			
	21 to 40					75.9	7031.9							11.8	214.1		
	41 to 60					5.7	1592.6							326.1	19385.8		
	61 to 80					12.7	1515.7							869.6	101372.1		
	81 to 100													625.5	85930.5		
	101 to 120													184	32037.8		
	121 to 140													6.7	832.5		
	141 to 160																
	161 to 180																
	181 to 200																
Forest Unit Subtotal		0	0	2.3	0	104.6	10175.6	Forest Unit Subtotal		7.3	176	16.3	4425.6	2049.4	239772.8		
POMXD	1 to 20					50.5								1.4			
	21 to 40					7.6	454.2							9	47.2		
	41 to 60					106.9	10622							77	5754.1		
	61 to 80			14.5	997.1	253.8	36098.2							216.5	25512.4		
	81 to 100			8.2	1198.4	87.5	13510.2							198.8	27935.7		
	101 to 120					2.2	316.8							26.4	3945.7		
	121 to 140					0								1.7	206.3		
	141 to 160					0											
	161 to 180					0											
	181 to 200																
Forest Unit Subtotal		0	0	22.7	2195.5	508.5	61001.4	Forest Unit Subtotal		1.6	217.1	12.4	1952.8	522.9	63401.4		
PW1	1 to 20					136.1								47.8			
	21 to 40					24.4	391.2							5	40.2		
	41 to 60			14.8	1818.4	309.6	31126							52.9	1864.2		
	61 to 80			28.4	3992.2	1102.9	142156.3							407.9	36220.4		
	81 to 100	5.3	678	72.2	14651.4	1344.2	208884.2							519.7	64825.8		
	101 to 120			83.2	15572.1	465.9	81384							70.2	8641.5		
	121 to 140			1.7	609.6	94	23592.4							3.1	548.4		
	141 to 160					3.6	562.9							20.3	2441.2		
	161 to 180			0.3	115.8	0.2	39.8										
	181 to 200																
Forest Unit Subtotal		5.3	678	200.6	36750.5	3480.9	488116.8	Forest Unit Subtotal		22.9	1148.7	50.2	3885.9	1132	114581.7		
OR1	1 to 20					24.3											
	21 to 40					0											
	41 to 60	2.6	255.8			11.2	787.9							47.4	626.9		
	61 to 80			8.7	920	242.9	30053.5							460	33670.5		
	81 to 100			21	2894.6	1842	295120.1							2128.1	241756.5		
	101 to 120			46.8	6303.9	527.4	98900.6							1990.6	292654.3		
	121 to 140					42.6	9401.2							218.3	38575.8		
	141 to 160													25.8	5462.7		
	161 to 180													1.2	195.0		
	181 to 200													7.2	580.6		
Forest Unit Subtotal		2.6	255.8	76.5	10118.5	2660.4	434263.3	Forest Unit Subtotal		34.4	4170.2	169.3	27871.2	4878.6	617522.9		
OR2	1 to 20					7.3											
	21 to 40	0.2	0.2											303.4	35.4		
	41 to 60					1.4	0.6	3.4	0					181.1	8805.7		
	61 to 80			9.1	1372.9	66.8	8524							1349.4	104803.1		
	81 to 100	9.8		50.1	7544.4	1153.2	168423							5301.2	623209.1		
	101 to 120	10.4				105.7	16169.8							7723.5	1157283.8		
	121 to 140													10100.1	279972.0		
	141 to 160													179	40043.5		
	161 to 180													25.1	3199.7		
	181 to 200													7.2	580.6		
Forest Unit Subtotal		20.4	0.2	59.6	8917.3	1333	193116.8	Total		94.5	6646	629.9	96119.3	16670.2	2217972.7		

Source:  
FMPPM FMP-9

MANAGEMENT UNIT NAME: Mazinaw-Lanark  
 PLAN TERM: April 1, 2001 TO March 31, 2006

### FMP-9 SUMMARY OF MANAGED CROWN PRODUCTIVE FOREST BY FOREST UNIT

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		(ha)	(m3)	(ha)	(m3)		(ha)	(m3)
PW1	FTG- 20					Com. Thin.	1,458	7,290
	21 - 40	10	288			Com. Thin.	297	8,910
	41 - 60			71	7,455	Com. Thin.	166	17,430
	61 - 80			148	23,680	Com. Thin.	210	33,520
	61 - 80					Prep. Cut	210	33,520
	61 - 80					Seed Cut	100	16,000
	81 - 100	3	533	909	190,890	Prep. Cut	285	59,850
	81 - 100					Seed Cut	520	109,200
	81 - 100					First Removal	110	23,100
	81 - 100					Final Removal	55	3,850
	101-120			266	66,500	Prep. Cut	35	8,750
	101-120					Seed Cut	296	74,000
	101-120					First Removal	89	22,250
	101-120					Final Removal	63	4,410
	121-140					Seed Cut	23	5,980
	121-140					First Removal	38	9,880
	121-140			19	4,940	Final Removal	15	3,900
	Forest Unit Subtotal	12	821	1,413	293,465		3,969	441,840
Pine1	FTG- 20			6	30	Com. Thin.	1,886	9,430
	21 - 40	7	152			Com. Thin.	706	16,238
	41 - 60	7	482	163	11,410	Com. Thin.	967	67,690
	61 - 80			1,406	168,720	Com. Thin.	3,369	404,280
	81 - 100					Seed Cut	5,203	832,480
	81 - 100	47	7,568	2,123	339,680	Final Removal	1,015	162,400
	101-120					Seed Cut	2,169	347,040
	101-120			658	105,280	Final Removal	1,449	231,840
	121-140					Seed Cut	33	5,280
	121-140			83	13,280	Final Removal	295	47,200
	141-160			2	320	Final Removal	44	7,040
	161-180					Final Removal	8	1,280
	Forest Unit Subtotal	61	8,201	4,441	638,720		17,144	2,132,198
HE1	FTG- 20					Prep. Cut	65	325
	21 - 40					Prep. Cut	6	120
	41 - 60					Prep. Cut	33	1,650
	61 - 80	2	263	9	990	Prep. Cut	232	25,520
	81 - 100					Prep. Cut	264	39,600
	81 - 100	21	3,152	76	11,400	Seed Cut	233	34,950
	101-120					Prep. Cut	688	123,840
	101-120			48	8,640	Seed Cut	861	154,980
	121-140					Prep. Cut	189	34,020
	121-140	9	1,573	19	3,420	Seed Cut	285	51,300
	141-160					Prep. Cut	58	10,440
	141-160					Seed Cut	87	15,660
	181-200					Seed Cut	13	2,340
	181-200					First Removal		720
	201-220			2	360			
	Forest Unit Subtotal	32	4,988	154	24,810		3,018	495,465

MANAGEMENT UNIT NAME: Mazinaw-Lanark  
 PLAN TERM: April 1, 2001 TO March 31, 2006

### FMP-9 SUMMARY OF MANAGED CROWN PRODUCTIVE FOREST BY FOREST UNIT

Forest Unit	Age Class	Protection Forest		Production Forest				
		(ha)	(m3)	Unavailable		Stage of Management	Available	
				(ha)	(m3)		(ha)	(m3)
OR1	FTG- 20			166	232	Corn. Thin.	2,072	4,144
	41 - 60	33	1,658	288	10,080	Corn. Thin.	220	11,000
	61 - 80					Seed Cut	3,086	277,740
	61 - 80	307	27,646	4,024	253,512	First Removal	1,089	98,010
	81 -100					Seed Cut	2,773	360,490
	81 -100					First Removal	6,546	850,980
	81 -100	468	60,791	15,645	1,423,695	Final Removal	425	55,250
	101-120					Seed Cut	127	20,320
	101-120					First Removal	1,223	195,680
	101-120			522	58,464	Final Removal	219	35,040
	121-140					First Removal	28	4,480
	121-140			17	1,904	Final Removal	7	1,120
	Forest Unit Subtotal	844	95,791	20,662	1,747,887		17,815	1,914,254
LH1	All	29	1,405	36	1,775		734	36,186
	Forest Unit Subtotal	29	1,405	36	1,775		734	36,186
LC1	FTG- 20			8	12		331	497
	21 - 40			2	4		3	6
	41 - 60			10	80		32	256
	61 - 80	3	121	60	2,100		517	18,095
	81 -100	5	311	118	7,080		2,369	142,140
	101-120			28	2,100		802	60,150
	121-140			3	195		71	4,615
	141-160						20	1,300
	161-180						8	520
	181-200	7	461				22	1,430
	Forest Unit Subtotal	16	894	229	11,571		4,175	229,009
HD1	All	22	3,225	1,277	191,550		19,765	2,964,750
	Forest Unit Subtotal	22	3,225	1,277	191,550		19,765	2,964,750
HD2	All	19	1,451	2,004	150,300		18,562	1,392,150
	Forest Unit Subtotal	19	1,451	2,004	150,300		18,562	1,392,150
HD4	FTG- 20	40	121			Corn. Thin.	906	2,718
	21 - 40					Corn. Thin.	20	300
	41 - 60	5	328	88	5,280	Corn. Thin.	282	16,920
	61 - 80					Seed Cut	1,179	117,900
	61 - 80	53	5,264	325	32,500	First Removal	618	61,800
	81 -100					Seed Cut	384	53,760
	81 -100	45	6,286	405	56,700	First Removal	671	93,940
	101-120					Seed Cut	43	6,020
	101-120					First Removal	160	22,400
	101-120	23	3,245	40	5,600	Final Removal	9	1,260
	121-140					Seed Cut	8	1,120
	121-140					First Removal	76	10,640
	121-140					Final Removal	5	700
	141-160					First Removal	14	1,680
	141-160	28	3,346			Final Removal	2	240
	161-180					First Removal	30	3,600
	161-180					Final Removal	3	360
	Forest Unit Subtotal	194	18,589	858	100,080		4,410	395,358

MANAGEMENT UNIT NAME: Mazinaw-Lanark  
 PLAN TERM: April 1, 2001 TO March 31, 2006

#### FMP-9 SUMMARY OF MANAGED CROWN PRODUCTIVE FOREST BY FOREST UNIT

Forest Unit	Age Class	Protection Forest		Production Forest				
		(ha)	(m3)	Unavailable		Stage of Management	Available	
				(ha)	(m3)		(ha)	(m3)
CM1	FTG- 20			27	81		394	1,182
	21 - 40			2	24		77	924
	41 - 60			19	665		212	7,420
	61 - 80	2	111	180	12,600		2,323	162,610
	81 -100			63	5,670		995	89,550
	101-120						279	27,900
	121-140			2	170		16	1,360
	141-160						12	1,020
	Forest Unit Subtotal	2	111	293	19,210		4,308	291,966
INT	FTG- 20	99	397	48	192		2,549	10,196
	21 - 40						468	9,360
	41 - 60	9	586	429	27,885		966	62,790
	61 - 80	235	23,931	3,827	390,354		9,159	934,218
	81 -100	92	11,010	801	96,120		3,853	462,360
	101-120			184	22,080		333	39,960
	Forest Unit Subtotal	435	35,925	5,289	536,631		17,328	1,518,884
MW2	21 - 40					Com. Thin.	31	465
	41 - 60			1,001	60,060	Com. Thin.	685	41,100
	61 - 80					Seed Cut	1,248	124,800
	61 - 80	33	3,267	3,093	309,300	First Removal	1,726	172,600
	61 - 80					Final Removal	648	64,800
	81 -100					Seed Cut	429	60,060
	81 -100	20	2,769	808	113,120	First Removal	1,288	180,320
	101-120					Final Removal	429	60,060
	101-120					Seed Cut	69	9,660
	101-120					First Removal	302	42,280
	101-120			33	4,620	Final Removal	93	13,020
	121-140					Seed Cut	10	1,400
	121-140					First Removal	55	7,700
	121-140			10	1,400	Final Removal	19	2,660
	141-160					First Removal	1	130
	Forest Unit Subtotal	52	6,036	4,945	488,500		7,033	781,055
MW1	FTG- 20						692	2,076
	21 - 40						41	1,230
	41 - 60			1,325	92,750		1,044	73,080
	61 - 80	169		4,256	468,160		8,716	958,760
	81 -100	18		817	122,550		3,470	520,500
	101-120			1	150		362	54,300
	121-140			14	2,100		0	
	181-200						7	770
Forest Unit Subtotal		186	0	6,413	685,710		14,332	1,610,716

MANAGEMENT UNIT NAME: Mazinaw-Lanark  
 PLAN TERM: April 1, 2001 TO March 31, 2006

### FMP-9 SUMMARY OF MANAGED CROWN PRODUCTIVE FOREST BY FOREST UNIT

Forest Unit	Age Class	Protection Forest		Unavailable		Stage of Management	Production Forest	
		(ha)	(m3)	(ha)	(m3)		(ha)	(m3)
ALL	FTG-20	140	518	255	547		10,353	37,858
	21-40	16	440	4	28		1,649	37,553
	41-60	55	3,054	3,394	215,665		4,607	299,336
	61-80	603	60,604	17,328	1,661,916		34,429	3,504,173
	81-100	718	92,420	21,765	2,366,905		31,317	4,194,840
	101-120	59	8,941	1,780	273,434		9,671	1,495,100
	121-140	9	1,573	167	27,409		1,173	193,355
	141-160	28	3,346	2	320		238	37,510
	161-180	7	461	0	0		49	5,760
	181-200	0	0	0	0		46	5,260
	201-220	0	0	2	360		0	0
	All	69	6,081	3,317	343,625		39,061	4,393,086
Total for all FUs		1,903	177,437	48,014	4,890,209		132,593	14,203,831
<b>Grand Total</b>		<b>1,903</b>	<b>177,437</b>	<b>48,014</b>	<b>4,890,209</b>		<b>132,593</b>	<b>14,203,831</b>

MANAGEMENT UNIT NAME: Mazinaw-Lanark  
 PLAN TERM: 2006 to 2011

FMP-9

**FMP-9**

**SUMMARY OF MANAGED CROWN PRODUCTIVE FOREST BY FOREST UNIT**

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Mgmt	Available	
		(ha)	(m3)	(ha)	(m3)		(ha)	(m3)
CM1	1-20		0	97	0		130	0
	21-40	5	61	14	195		141	1,900
	41-60	25	1,471	251	14,926		1,083	64,414
	61-80	13	1,450	349	38,892		1,248	139,147
	81-100	7	1,056	218	31,687		743	108,070
	101-120	4	627	58	9,438		445	71,903
	121-140		0	15	1,905		182	23,610
	141-160		0	36	4,174		7	853
	161+		0	0	0		2	207
	<b>FU Subtotal</b>	<b>53</b>	<b>4,665</b>	<b>1,039</b>	<b>101,217</b>		<b>3,981</b>	<b>410,103</b>
HD1	<b>FU Subtotal</b>	<b>12</b>	<b>511</b>	<b>4,082</b>	<b>347,501</b>	Selection	<b>25,056</b>	<b>2,133,017</b>
HD2	<b>FU Subtotal</b>	<b>35</b>	<b>1,147</b>	<b>3,287</b>	<b>215,441</b>	Selection	<b>16,368</b>	<b>1,072,812</b>
HD4	1-20		0	73	0		313	0
	21-40	10	64	10	63		145	941
	41-60	52	1,572	691	21,068	ComThin	1,079	32,897
	61-80	78	4,541	2,804	164,008	Seed Cut	5,180	303,030
	81-100	21	1,700	502	40,404	Seed Cut	1,413	113,747
	101-120		0	141	12,754	1st Rem.	471	42,626
	121-140		0	61	5,337	Final Rem.	147	12,789
	141-160		0	0	0	Final Rem.	26	1,927
	161+		0	8	523	Final Rem.	0	0
	<b>FU Subtotal</b>	<b>160</b>	<b>7,876</b>	<b>4,290</b>	<b>244,157</b>		<b>8,774</b>	<b>507,957</b>
HE1	1-20		0	0	0		3	0
	21-40		0	7	14		0	0
	41-60		0	32	1,383		26	1,118
	61-80	6	653	51	5,296		178	18,554
	81-100		0	69	10,849	PrepCut	415	65,001
	101-120	2	331	22	4,083	Seed Cut	457	85,861
	121-140		0	52	10,125	1st Rem.	524	102,489
	141-160		0	11	2,083	Final Rem.	98	18,859
	161+		0	0	0	Final Rem.	90	16,964
	<b>FU Subtotal</b>	<b>8</b>	<b>984</b>	<b>243</b>	<b>33,834</b>		<b>1,791</b>	<b>308,845</b>
INT	1-20	9	37	232	928		1,073	4,291
	21-40	15	675	16	731		1,219	54,253
	41-60	77	7,887	545	55,604		1,283	130,866
	61-80	63	9,186	2,073	300,530		4,377	634,716
	81-100	3	412	698	111,284		3,243	517,272
	101-120		0	37	5,735		163	25,069
	121-140		0	0	0		4	588
	141-160		0	0	0		0	0
	161+		0	0	0		0	0
	<b>FU Subtotal</b>	<b>168</b>	<b>18,197</b>	<b>3,601</b>	<b>474,812</b>		<b>11,363</b>	<b>1,367,056</b>
LC1	1-20		0	59	0		133	0
	21-40		0	21	126		57	345
	41-60	6	191	62	1,904		284	8,662
	61-80	29	1,999	165	11,467		794	55,195
	81-100	25	2,512	310	31,670		1,679	171,267
	101-120	12	1,415	119	14,061		793	93,969
	121-140		0	8	890		241	26,242
	141-160	6	585	4	354		25	2,412
	161+	7	651	0	0		35	3,148
	<b>FU Subtotal</b>	<b>85</b>	<b>7,354</b>	<b>748</b>	<b>60,472</b>		<b>4,041</b>	<b>361,239</b>
LH1	<b>FU Subtotal</b>	<b>203</b>	<b>5,584</b>	<b>379</b>	<b>20,851</b>	Selection	<b>1,866</b>	<b>102,658</b>
MW1	1-20		0	358	0		1,200	0
	21-40	32	614	208	3,955		794	15,081
	41-60	104	7,283	1,630	114,104		3,984	278,880
	61-80	232	29,410	3,854	489,482		6,357	807,339
	81-100	18	2,958	1,423	234,765		2,834	467,571
	101-120	2	364	66	11,909		399	72,257
	121-140		0	21	2,930		73	10,271
	141-160		0	0	0		0	0
	161+		0	0	0		6	679
	<b>FU Subtotal</b>	<b>388</b>	<b>40,628</b>	<b>7,560</b>	<b>857,145</b>		<b>15,646</b>	<b>1,652,078</b>

**MANAGEMENT UNIT NAME:** Mazinaw-Lanark  
**PLAN TERM:** 2006 to 2011

FMP-9

## 2009 Independent Forest Audit

**Table 6 - SUMMARY REPORT OF RENEWAL, TENDING AND PROTECTION OPERATIONS (RPFO-7)**

MU: Lanark (1993-2001) and Mazinaw-Lanark (2001-2011)

Area is Annualized for the indicated period	Area Summary of all Forest Units (ha)								4-term average [%]	
	1993-1999		1999-2001		2001-2006		2006-2011			
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	*Actual		
<i>Renewal</i>										
<i>Regeneration</i>			0.0	0.0	0.0	0.0	0.0	0.0		
<i>Uneven-Aged Management</i>			0.0	0.0	0.0	0.0	0.0	0.0		
Selection Cut - Harvest	59.0	58.8	117.0	41.0	931.0	617.0	1,144.9	493.5		
Total Uneven-Aged Management	59.0	58.8	117.0	41.0	931.0	617.0	1,144.9	493.5	54%	
<i>Even-Aged Management</i>			0.0	0.0	0.0	0.0	0.0	0.0		
<i>Natural Regeneration</i>			0.0	0.0	0.0	0.0	0.0	0.0		
Clearcut	37.2	8.0	14.5	13.5	220.8	28.6	0.0	18.5		
Strip Cut	23.4	6.0	0.0	0.0	0.4	0.0	0.0	0.0		
Seed Tree Cut			0.0	0.0		58.4	305.8	117.5	58%	
Uniform Shelterwood Seed Cut	202.4	62.2	151.0	37.0	267.2	387.0	287.9	272.5	84%	
Subtotal Natural	263.0	76.2	165.5	50.4	488.6	474.0	593.7	408.5	67%	
<i>Artificial Regeneration</i>			0.0	0.0	0.0	0.0	0.0	0.0		
Planting	94.0	24.7	113.0	34.4	264.2	124.2	352.1	131.0	38%	
Seeding direct with site preparation			0.0	0.0	0.0	0.0	0.0	0.0		
Scarification			0.0	0.0	91.0	0.0	91.4	34.5	19%	
Subtotal Artificial	94.0	24.7	113.0	34.4	355.2	124.2	443.5	165.5	35%	
Total Even-Aged Management	357.0	100.9	278.5	84.8	843.8	598.2	1,037.2	574.0	54%	
Total Regeneration	416.0	159.7	395.5	125.8	1,774.8	1,215.2	2,182.1	1,067.5	54%	
<i>Site Preparation</i>										
<i>Mechanical</i>			0.0	0.0	0.0	0.0	0.0	0.0		
Enhanced	33.4	8.0	68.5	31.4	264.2	167.0	309.1	84.5	43%	
Chemical			0.0	0.0	0.0	0.0	0.0	0.0		
Prescribed Burn	82.2	8.8	23.5	0.0	28.2	8.8	32.4	0.0	11%	
Total Site Preparation	4.0	17.8	23.5	0.0	0.0	0.0	33.4	0.0	29%	
Total Site Preparation	119.6	34.6	115.5	31.4	292.4	296.2	375.0	84.5	49%	
<i>Tending</i>										
<i>Cleaning</i>			0.0	0.0	0.0	0.0	0.0	0.0		
manual	38.2	25.7	58.0	7.5	140.6	181.4	398.2	121.0	53%	
chemical - ground	94.2	9.5	5.5	0.0	75.0	30.6	48.5	0.0	18%	
-aerial			0.0	0.0	0.0	0.0	0.0	0.0		
mechanical			10.7	0.0	0.0	0.0	0.0	0.0		
prescribed burn			110.0	60.0	0.0	0.0	32.0	0.0		
<i>Spacing, pre-commercial thinning, improvement cutting</i>			0.0	0.0	0.0	0.0	0.0	0.0		
even-aged	68.8	25.5	47.5	74.7	180.0	40.4	354.7	94.5	38%	
uneven-aged	30.8	2.7	24.0	5.4	514.8	182.8	568.4	235.0	37%	
<i>Cultivation</i>			0.0	0.0	0.0	0.0	2.8	0.0		
<i>Pruning</i>			0.0	0.0	0.0	0.0	0.0	0.0		
Total Tending	232.0	74.1	245.0	147.4	910.4	438.0	1,401.9	450.5	40%	
<i>Protection (Insect Pest Control)</i>										
accelerated harvest							15.9			
salvage							0.0			
manual protection										
ground insecticide										
aerial insecticide										
Total Protection					0.0		15.9		0.0	

Source:

Table 25 RPFO-7 FMP-25 RPFO-7 FMP-25 10 YR AR-7 FMP-25 AR-6a  
(e.g., TMP 4.19) (1993-1998) & (1999-2001) (1999-2001) (2001-2006) (2001-2006) (2006-2011) (2007-2008)  
(1998-1999) AR-6 (1998-1999)

\* 2006-2011 actual areas are annualized from 2 years of reporting (e.g., 2006-2008)

## 2009 Independent Forest Audit

**Table 7 - Harvested Area Successfully Regenerated - Summary of All Forest Units**

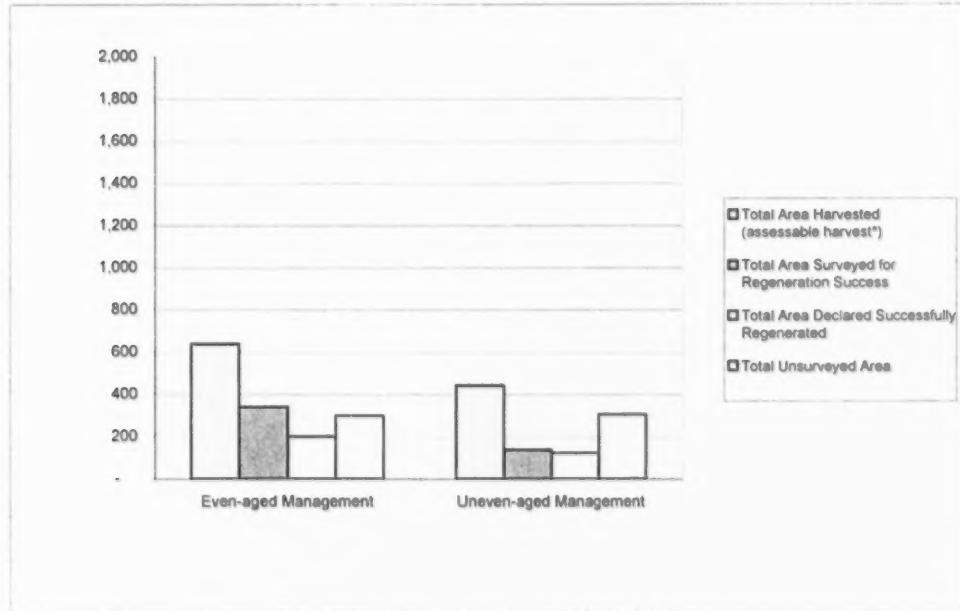
MU: Lanark (1993-2001)

	AREA IN HECTARES (All Forest Units Combined)	AREA IN HECTARES (All Forest Units Combined)	Entire area of Even-aged harvest** [ha]
	Even-aged Management	Uneven-aged Management	
Total Area Harvested (assessable harvest*)	637	440	872
Total Area Surveyed for Regeneration Success	340	136	
Total Unsurveyed Area	297	304	
Total Area Declared Successfully Regenerated	199	122	
<b>Total Area Surveyed Not Successfully Regenerated</b>	<b>141</b>	<b>14</b>	
NSR	-	-	
B&S	-	-	
Not Available for Regen. (e.g. Roads & landings)	-	-	
Other	-	-	
<b>Percent of Area Surveyed Declared Successfully Regenerated</b>	<b>58.5%</b>	<b>89.7%</b>	

Source: AR 1997-98 (AR-1, AR-2 to-date); RPFO-3 1998-99; AR 2000-01 (AR-1 to-date); Maz-Lan assessments 2001-2009

\* Assessable harvest includes all selection, all clearcut and shelterwood SEED CUT

\*\* All even-aged harvest, including assessable.



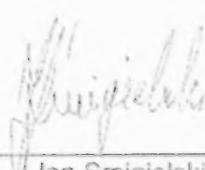
INDEPENDENT FOREST AUDIT 2009

COMPARISON AND TREND ANALYSIS OF PLANNED  
VS. ACTUAL FOREST OPERATIONS

MAZINAW MANAGEMENT UNIT & MAZINAW-LANARK  
FOREST

August 25, 2009

Prepared by:

  
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Mazinaw Lanark Forest Inc.

Acknowledgement: Tables 1 – 6 compiled by Nick Baggs, R.P.F.

**Independent Forest Audit      2009**

**Comparison And Trend Analysis Of Planned Vs. Actual Forest Operations**

**Mazinaw Management Unit & Mazinaw-Lanark Forest**

**August 25, 2009**

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**Introduction**

This report has been prepared in accordance with Appendix C of the *Ontario Ministry of Natural Resources Independent Forest Audit Process and Protocol (IFAPP)* Copyright (c) Queens Printer, February, 2008 (updated January 2009 for use with 2009 audits). The Comparison and Trend Analysis (CTA) is intended to summarize and compare planned with actual operations carried out during the five-year term of the current forest management plan (FMP) as well as during the two preceding five-year terms and identify significant trends over time.

The report is intended to support the assessment of forest sustainability and the achievement of management objectives as specifically described in Criteria 7.4 of the IFAPP. Also, in accordance with Appendix C, this report has been prepared with the use of the most recent Report of Past Forest Operations (RPFO) 1996-2001 (Mazinaw) and the Year 10 Annual Report for the Mazinaw-Lanark Forest prepared for the year 2005-06.

Tables 1 to 7 in this report were prepared specifically for the Independent Forest Audit and contain information from the current and previous plans, RPFOs and annual reports while tables FMP-9, used to fulfill the requirements for CTA Table 5, were originally developed for the FMP 2001-2021 and 2006-2026 for the Mazinaw-Lanark Forest. Planned/actual levels of achievement in Tables 3, 4 & 6 have been annualized to facilitate comparison between the previous terms and the current term for which complete reporting of operations is not yet available. Areas contained in Tables 1 and 5 reflect only the managed Crown land portion of the management unit as defined in the 1996 *Forest Management Planning Manual for Ontario's Crown Forests* (FMPM).

Normally, each CTA five-year term would correspond to the five-year term of the current FMP and two preceding Timber Management Plans (TMP) and/or Forest Management Plans (FMP). For the Mazinaw Management Unit (MU), this approach has been modified to accommodate the amalgamation of the Mazinaw and Lanark Management Units in 2001 to create the Mazinaw-Lanark Forest, managed by Mazinaw-Lanark Forest Inc. As a result, this CTA includes two terms that are common to both the CTA for the Mazinaw MU as well as that for the Lanark MU, while the terms prior to amalgamation are different and specific for each MU. This provides the logical platform for the analysis and is consistent with the approach used in 2004 for the previous Independent Forest Audit.

The following table shows the duration of the terms selected for this CTA, the status of completed Annual Reports and the relationship to the corresponding management plans:

**Table A. FMP Terms Used for the Analysis**

Term	Duration in years	Management Plan	Prepared by
1996- 2001	5 (completed)	1996-2001 FMP for the Mazinaw Management Unit	MNR
2001-2006	5 (completed)	2001-2006 FMP for the Mazinaw-Lanark Forest	MLF
2006-2011	5 (2 completed)	2006-2011 FMP for the Mazinaw-Lanark Forest	MLF

The 1996-2001 FMP for the Mazinaw Crown MU was prepared by MNR using the 1986 *Timber Management Planning Manual for Crown Lands in Ontario* (TMPM). The 2001-2006 and 2006-2011 Forest Management Plans for the Mazinaw-Lanark Forest, prepared by Mazinaw-Lanark Forest Inc. were developed in accordance with the 1996 Forest Management Planning Manual for Ontario's Crown Forests (FMPM).

### **Summary of Total Area Under Management**

Important factor to be considered in the analysis of area under management is the replacement of Forest Resource Inventory (FRI) for almost 90% of the Mazinaw-Lanark Forest between 2001 and 2006.

FRI for the former Mazinaw Management Unit, used for Mazinaw-Lanark FMP 2006-2011 in combination with the data from the former Lanark MU, was generated from the aerial photography 1997 and updated for April 1, 2006. This data completely replaced the previous FRI for the corresponding area that was based on aerial photography 1978 and used in the previous forest management plans including the 1996-2001 FMP for the Mazinaw MU and the 2001-2006 FMP for the Mazinaw-Lanark Forest. Consequently, the portion of the Mazinaw inventory for the 2006-2011 FMP that has not been updated to reflect management activities between 1997 and 2006, reflects the conditions on the ground as of the date of photography, i.e. summer 1997.

**Table 1** summarizes the total area under management for the current term and two preceding terms. The figures are for the Managed Crown land only. Tables from the 1996-2001 FMP for the Mazinaw MU, the 2001-2006 FMP and 2006-2011 FMP for the Mazinaw-Lanark Forest were used to define the land base under management at the beginning of each term. Since twelve specified working groups were used in Table 1 to summarize the area of production forest, it was necessary to combine some of the working group areas shown in Tables TMPM 4.8.2, TMPM 4.9, FMP-1 & FMP-2 from the various management plans. Direct comparison of the figures for the current term with both past terms is obstructed by the fact that the total area under management for the current term and the 2001-2006 term is from the amalgamated Mazinaw-Lanark Forest while the area for the 1996-2001 term is from the former Mazinaw MU only.

Table 1 indicates an increase in the total production forest area between 2001 and 2006 by 6,687 ha. (3.7%). This is a combined result of several factors affecting new FRI and includes subtle shift from non-productive forest area, particularly Rock and Barren & Scattered to forest stands with closed canopy, which is partially offset by the opposite trend from productive forest to wetlands and the refinements in the ownership data, as documented in Mazinaw-Lanark FMP 2006-2011, pg. 34.

The apparent stability in the total production forest area between 1996-2001 to 2001-2006 periods demonstrated in Table 1 requires clarification to address the change in the land base with the amalgamation of the Mazinaw and Lanark MU. The logical effect of amalgamation in 2001 should be the increase in the total area by adding Mazinaw production forest area reported in 1996 as 179,385 ha and the Lanark Production Forest, which in 1999 was reported as 17,301 ha for a total of 196,686 ha. Table 1 shows only 180,521 ha, an increase of 1,136 ha suggesting a loss of 16,165 ha with amalgamation. However, comparison of Tables 4.8.2 & 4.8.3 (1996 Mazinaw FMP), FMP-1 (1999 Lanark CMP) and FMP-1 (Mazinaw-Lanark Forest FMP) reveal a corresponding increase of 15,465 ha of Crown unmanaged production forest and 837 ha of Parks production forest, alleviating concerns regarding the real loss of production forest. Further comparison shows a 136 ha gain in total Crown production forest including Parks and unmanaged land, a 427 ha gain in total Crown productive forest, and a 1,564 ha gain in total Crown forested land.

The movement of Crown managed production forest area into Crown unmanaged forest and Parks is attributed to:

- a) The designation of several areas as Provincial Park Additions and Conservation Reserves under Ontario's Living Legacy (OLL) process, and

- b) The exclusion of provincially significant Areas of Natural and Scientific Interest (ANSIs) in accordance with the Madawaska Highlands Land Use Plan.

These areas were incorporated into the 2001 FMP for the Mazinaw-Lanark Forest as withdrawn from the managed production forest, some of them still pending the legal regulation. OLL protected areas include the Bon Echo Provincial Park Additions, Burnt Lakes and Puzzle Lake Provincial Parks, as well as the White Lakes Wetlands, Mellon Lake, Crotch Lake, Hungry Lake, Lingham Lake, Elzevir Peatlands, and Mount Moriah Conservation Reserves. Also, three ANSIs (e.g., Summit Lake, Fortune-Schooner & Darling) were established within the Mazinaw-Lanark Forest in accordance with the Madawaska Highlands Land Use Plan. The protection of these areas contribute to meeting a number of FMP objectives in the for the Mazinaw-Lanark Forest, including objectives for landscape forest diversity, other land use, recreation, and natural values dependent on forest cover. Several Enhanced Management Areas also designated in the Mazinaw-Lanark Forest through OLL process also contribute to many of these objectives but do not result in production forest area withdrawals.

Table 1 also reveals that the area classified as B&S and NSR / Depleted accounts for only a small portion of the total production forest: 5.2% in 1996, 4.2% in 2001 and 2.1% in 2006. This relatively low proportion is attributed primarily to the nature of Mazinaw-Lanark Forest, characterized by a very diverse mixed species and multi-storey composition with high component of tolerant hardwoods and white pine, which lends itself mostly to partial harvesting systems and continuous maintenance of canopy. The decreasing trend over time can be explained primarily by the natural process of canopy closure on undisturbed areas previously classified as B&S, regeneration activities on harvested areas as well as FRI data automation in 1999, which resulted in reclassification of portion of NSR polygons for the between 1996 and 2001.

The comparison of production forest area by working group over time as presented in Table 1 shows most dramatic changes in the hard maple (Mh) and other hardwood (H) categories, which combined make up the largest component of the Mazinaw-Lanark Forest. Hardwood area shows steady increase over three terms from 41,108 ha in 1996 to 63,521 ha in 2006, while Mh area shows major decrease from 58,726 ha in 1996 to 36,342 in 2001 ha followed by increase to a level of 45,546 ha in 2006. Such changes do not form fully consistent pattern and require explanation. Three primary factors contribute to the wide shifting of area in these two working groups: 1) different grouping of major species between the three periods; 2) changes resulting from refined FRI standards applied in the 2006 inventory, and 3) the actual changes on the landscape. Soft maple (Ms) and red oak (O, Or or Ox), two major species in the Mazinaw-Lanark Forest, were inconsistently treated in the FRI data in the past. For example in the 1996 inventory Ms was included with Mh working group, while red oak was included with Other Hardwoods shown in Table 1 as H. In 2001 inventory Ms was grouped together with oak in the H working group which explains a sudden increase in H and drop in Mh in the corresponding period. The grouping of species in 2006 was the same as in 2001, however the replacement of FRI with new data introduced the refined FRI standards and the impact of actual changes on the landscape in 20 year period since the previous inventory was compiled. The size of the area changes between 1996 and 2001 is further accentuated by the merger of FRI data with Lanark portion, where Mh, H and Pw are the three largest components.

The comparison of area of the other working groups between 1996 and 2001 shows a relatively static picture, which is consistent with the fact that large majority of data is derived from the same original inventory for former Mazinaw MU accounting for 90% of the Mazinaw-Lanark Forest.

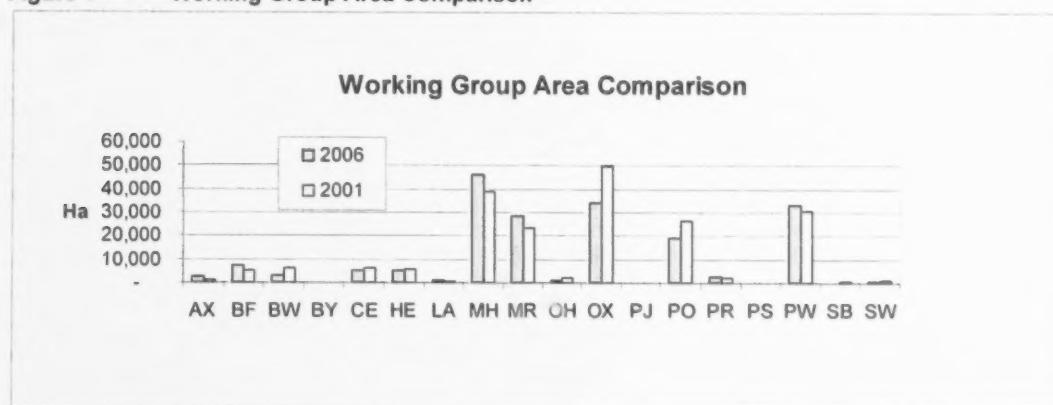
In order to obtain additional insight into the actual forest composition and potential trends on the landscape the content of two inventories 2001 and 2006 was compared in the Mazinaw-Lanark FMP 2006-2011. This analysis is summarized below.

Figure 1 titled Working Group Area Comparison illustrates side by side the area of working groups recorded in 2006 and 2001 (total area on the managed Crown productive forest land derived from Table FMP-2 from each FMP). The graph also provides the overview of the relative abundance of working groups in the management unit. The more noticeable changes in the working group area between the old and new inventory are listed below.

The area of the following working groups decreased: oak (OX) by 31%, poplar (PO) by 27%, white birch (BW) by 51% and white cedar (CE) by 18%.

The area of the following working groups increased: hard maple (MH) by 18%, soft maple (MR) by 25%, balsam fir (BF) by 49%, white pine (PW) by 8% and red pine (PR) by 18%.

**Figure 1 Working Group Area Comparison**



These changes do not necessarily follow one specific and consistent pattern. A major factor that cannot be discounted is the enhanced methodology used during the photo-interpretation process, leading to more rigorous "netting-down" of the distinct features in forest canopy as opposed to the aggregation of canopy pattern applied in 1978. Such focused assessment would typically lead to smaller area of species that tend to occur in patches (e.g. poplar), rather than in uniform pattern across larger area (e.g. maple). Despite the difficulty with precise interpretation of the comparison the following observations seem applicable:

- In terms of total area the most dramatic decline occurred in the oak working group: 15,000 ha decrease. The area of oak on the landscape was probably overestimated in the old inventory but the very slow natural downward trend in the abundance of oak is already underway.
- The most radical proportional change is observed in the white birch working group: 51% decrease. Considering the advanced average age of both white birch and poplar, it is apparent that the decline of both species is also underway and will probably accelerate over the next several decades. Inception of this trend has already emerged in the Trend Analysis prepared for the Independent Forest Audit 2004 and in the Report of Past Forest Operations 1996-2001 (Mazinaw).
- The increase in the maple working group (both hard and soft maple) cannot be easily interpreted. A plausible explanation could attribute this result to the advancement of both species over the last 20 years from the undetected understorey to the position of overstorey at the expense of such species as poplar, white birch and oak, consistent with natural pattern of succession. In the case of soft maple such trend is augmented by very high adaptability of this species to all site conditions.
- Relatively slow but steady re-emergence of white pine as a dominant component on the landscape is apparent, consistent with the trend presented in the Trend Analysis 2004 and the Report of Past Forest Operations 1996-2001 (Mazinaw). Based on field observations the movement from understorey to overstorey described for maple most likely also applies to white pine, accentuated by sustained management effort to support this species. The latter factor is probably a primary contributor to the increase of the red pine area.
- The cause of relative increase in the abundance of balsam fir is not clear. In fact the upward trend is opposite to the trend observed in the Trend Analysis 2004 and the Report of Past Forest Operations 1996-2001 (Mazinaw). Part of the explanation could potentially include the difficulty in distinguishing balsam fir during the photo-interpretation process from other species such as hemlock, spruce or cedar in the earlier stages of development.

- It is relevant to observe that the total area of hemlock working group has decreased by a margin of 9%. However field observations indicate that hemlock is quite abundant on the landscape but routinely escapes detection through photo-interpretation because of its high shade tolerance and persistence in the understorey position.

**Table 2** describes the forest units used in the various management plans for the current term and the preceding two terms and lists the silvicultural systems employed in their management. It also shows the relationship between forest units and defined working groups from Table 1. Reference to related site types and detailed FRI parameters and classification criteria are also provided where such information was used to differentiate forest units. Additional comments are provided to place forest units within the proper management context. Since forest units were modified with the production of each subsequent TMP or FMP, it was necessary to list them for each term.

**Table 5** is intended to summarize the managed productive forest area by forest unit for each of the CTA terms. Since table FMP-9 from the 2001-2006 FMP and 2006-2011 FMP for the Mazinaw-Lanark Forest contains the same information required to complete Table 5, therefore two tables FMP-9 are provided in place of Table 5 for both terms. In contrast, Tables 4.8.2 & 4.9 from the 1996-2001 FMP provide little of the information to complete Table 5 in the prescribed format. Moreover, this information is summarized by working group instead of forest unit. Accordingly, Table 5 has been modified to summarize information for the term 1996-2001.

Although direct comparison between forest units for all three terms is impossible because of the change in the format between 1996 and the two latter terms, a trend between 2001 and 2006 can be identified since the criteria defining forest units are similar and the land base is the same.

For the purpose of illustration Figure 2 compares the total area of each forest unit (available and unavailable for timber production) between 2001 and 2006, based on the corresponding Tables FMP-9.

Similar to the working groups the observed changes result from the replacement of FRI but they also reflect the refinement in the criteria for individual forest units applied in 2006 relative to the 2001. Refinements were applied in the PW1, OR1 and HD2 forest units. The most dramatic downward shift occurred in OR1 forest unit: from 39,321 ha in 2001 to 21,596 ha in 2006 as a combined effect of the decline in the oak working group and the criteria refinement aimed at netting down the area more suitable for oak management. The upward trend is most pronounced in MW2 and HD1 forest units, reflecting the overall increase in maple area and the highly diverse nature of the forest with additional impact of criteria refinement on the sequential stand sorting process.

Age is an important attribute used to describe forest condition. In an attempt to summarize the change in the age structure across all forest units Table B is presented to demonstrate the relative change in the proportion of total production forest by age class through all three CTA terms. This approach allows to alleviate the problem associated with the difference in the land base in 1996 compared to 2001 and 2006. The proportion encountered in 1996 was used as a base for comparison to better capture the trend over time.

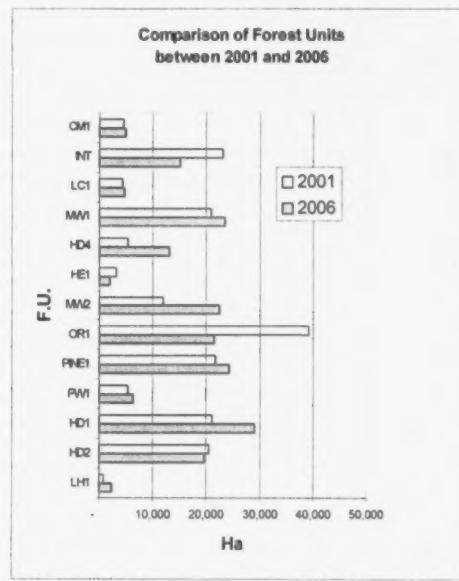


Figure 2

**Table B**  
**Percentage of Total Production Forest by Age Class Over Time (using 1996 as a base).**

Age Class	Percentage of Total Production Forest by Age Class (%)		
	Mazinaw 1996 (Table 5)	Mazinaw-Lanark 2001 Table FMP-9 (Avail. + Unavail.)	Mazinaw-Lanark 2006 Table FMP-9 (Avail. + Unavail.)
		←decrease increase→ relative to 1996	←decrease increase→ relative to 1996
0 - 20 (incl. B&S/NSR)	6.4%	5.9%	2.5%
21 - 40	1.1%	0.9%	1.9%
41 - 60	22.8%	4.4%	10.1%
61 - 80	46.9%	28.7%	27.2%
81 - 100	19.3%	29.4%	23.0%
101 - 120	3.1%	6.3%	6.0%
121 +	0.5%	0.9%	2.0%
All-age	-	23.5%	27.3%
	100%	100%	100%

In addition to high concentration of forest area in the middle range of age classes (41 – 100 years) Table B shows a gradual general shift to older age classes, most evident by the decrease in the 61-80 age class and the corresponding increase in the 81-100 age class. The use of the all-age category for forest units managed under selection system in Table FMP-9 for 2001-2006 and 2006-2011 terms and the absence of this category in Table 5 for 1996-2001 term does not allow for the complete comparison, however the trend is still apparent and expected.

#### Summary of Planned and Actual Harvest Volumes

**Table 3** summarizes planned and actual harvest volumes for the current term and two preceding terms. Planned and actual levels of achievement have been annualized to facilitate comparison between terms. Volumes are shown by species or species groupings.

Planned harvest volumes were derived using TMPM Table 4.18.1 from the 1996-2001 Mazinaw FMP for the that term, while Tables FMP-21 from the Mazinaw-Lanark 2001-2006 FMP and 2006-2011 FMP were used to derive planned harvest volumes for these two terms respectively. To report actual harvest volumes Table RPFO-4 (1996-2001) was used for the Mazinaw MU for 1996-2001 CTA term, Table AR-4 from Year 10 AR was used for the Mazinaw-Lanark 2001-2006 term and finally, tables AR-4 (2006-07 and 2007-08) were used to report harvest volumes for the first two years of the current term.

Volume for several species was lumped together in the species group labeled OH in order to facilitate broader comparison and to reduce the impact of various changes and inconsistencies between breakdown of species in the forecast for different terms and in the summaries from the Provincial Billing and Scaling System (currently known as TREES). For example soft maple (Ms) is listed in the scaling summaries together with Mh but in the forecasts it was treated variably - first combined with Mh in 1996-2001, then lumped with lowland hardwoods in 2001-2006 and with upland hardwoods in 2006-2011. The other major components of the OH category on the forecast side include oak and, to a lesser degree, beech.

Salvage of wood material blown down in 2002 following a micro-burst event in 2002 and to a smaller degree in 2006 introduces a new factor, absent in the 1996-2001 term. Salvage volume is included in Table 3 with regular volume to provide better picture of the harvest effort that took place on the Mazinaw-Lanark Forest, however the area associated with salvage is reported in Table 4 separately under Natural Depletion, consistent with the reporting practice. Salvage volume for the 2001-2006 term amounts to a total of 56,740 m<sup>3</sup> or 11,348 m<sup>3</sup> annually, which represents 12% of the total harvest volume. Salvage for

the first 2 years of 2006-2011 term adds up to 8,664 m<sup>3</sup> or 4,332 m<sup>3</sup> annually, which represents 4% of the total harvest.

Tables C and D are presented below to throw additional light on potential trends that may not be readily discernible from Tables 3 and 4.

**TABLE C Actual Harvest Volume Relative to Forecast Volume by Species**

Species	Actual harvest volume as percentage of forecast volume [%]			Weighted average percentage for all terms [%]
	Past Plans		Current	
	1996 - 2001	2001 - 2006	2006 - 2011	
Pw	78%	90%	47%	67%
Pr	38%	95%	87%	71%
Pj / Sb			0%	0%
Sw	33%	26%	33%	31%
He	14%	33%	41%	29%
Bf	14%	11%	6%	8%
Ce	12%	26%	15%	17%
La		112%	0%	85%
Po	70%	53%	58%	60%
Bw	27%	51%	59%	44%
Mh	52%	120%	161%	100%
OH	83%	50%	69%	63%
Total	58%	67%	69%	65%

**TABLE D Actual Harvest Volume Relative to Forecast Harvest Volume, Yield and Actual Harvest Area over Time for the Mazinaw MU and Mazinaw-Lanark Forest.**

Term	Actual harvest area as % of planned area [%]	Actual harvest volume as % of planned volume [%]		Forecast yield [m <sup>3</sup> / ha]	Actual yield (no salvage) [m <sup>3</sup> / ha]
		without salvage volume	Salvage volume included		
1996 – 2001	60%	58%	58%	62.9	61.5
2001 – 2006	60%	59%	67%	65.1	64.0
2006 - 2011	52%	66%	69%	61.2	72.1

The analysis of the presented information leads to the following assessment:

Overall volume and area harvest rates fluctuated around 60% of forecast level for all three terms. This pattern, recognized in the past, cannot be explained by any single or immediately detectable factor. Instead a wide array of issues contributes to the trend in various ways, not always identical from term to term, as reported in the Summary of the RPFO (Mazinaw-Lanark FMP 2006-2001, Supp. Doc. F).

- Certain forest types remain under utilized due to their marketability, economic viability, area/size and merchantability of these forest types.
- Adjustments in the Unanimous Shareholders Agreement impacted on the allocation and harvest strategies.
- Certain SFL shareholders have been more successful at utilizing their harvest allocations than others.
- Some of the stands allocated for harvest were by-passed (not treated) due to their inoperability (limiting factors; merchantability, stocking, terrain, area reductions).
- Operations to salvage material damaged by a severe windstorm in 2002 disrupted normal harvest activities.
- Markets for low-grade fibre (hardwood and softwood) continue to be a challenge and have a direct impact on harvest accomplishments.

- Solutions to making the harvest of low-grade fibre economically viable have not been found to the satisfaction of harvesting contractors.

Broader industry adjustments such as closure of Domtar Cornwall pulp mill in 2004-05 or O.E. Rothwell sawmill in Lanark in 2005-06 also contributed negatively to the overall harvest levels.

Table C shows a pattern of high harvest levels for Mh, Pw, Pr and OH vs. low harvest level for balsam fir (B), He, Ce and Sw. This is consistent with the predominant market conditions where the demand for the former group of species has been traditionally high, while the demand for the latter species is very weak or in some cases non-existent. Although it cannot be denied that differential demand for various species creates several challenges including the ability to carry out silvicultural treatments during and after harvest, the observed utilization of harvested timber on the ground is relatively high as supported by good results of compliance monitoring program.

As presented in Table D the rate of volume harvest relative to forecast is fairly consistent with the rate of area harvest except for the first two years of the current term (2006-2011) when it exceeds the area rate by a significant margin. Coincidentally volume yield per hectare for the same period is also higher than forecast while the yields for the previous two terms are very close to the forecast. This trend, reminiscent of the scenario presented 5 years earlier in the CTA 2004, can be explained by two factors: a distortion created in the initial years of FMP by reporting full harvest volume with partial reporting of some areas that are not yet completed and the tendency on the part of the licensees to harvest more accessible and higher yield areas in the initial years of the FMP term before moving to the less productive areas in the latter part of the term. The comparison of actual annual harvest volume and area for the 2001-2006 term presented in this CTA with the average volume and area for the first two years of the same term presented in the previous CTA (2004) reveals accelerated harvest levels in the latter part of 2001-2006 term, while the yield per ha, initially high, declined slightly below the forecast by the end of the term. This observation supports the assessment of the overall rational utilization of the available resources.

#### **Summary of Planned and Actual Harvest Area**

**Table 4** summarizes planned and actual harvest areas for the current term and two preceding terms. Consistent with the other tables in this analysis planned and actual levels of achievement have been annualized. Harvest areas are shown for each term by forest unit, corresponding to those described in Table 2.

Planned harvest areas were derived using TMPM Table 4.15 from the 1996-2001 Mazinaw FMP for the 1996-2001 term while Tables FMP-18 from the Mazinaw-Lanark FMP 2001-2006 and 2006-2011 were used to derive planned harvest areas for the corresponding two terms. To report actual depletion area Table RPFO-1 (1996-2001) was used for the 1996-2001 term while Table AR-1 from Year 10 AR was used for the Mazinaw-Lanark 2001-2006 term and tables AR-1 (2006-07 and 2007-08) were used to report harvest areas for the first two years of the current term.

The annual area of natural depletion presented in Table 4 for 2001-2006 term in the amount of 242 ha corresponds with the total 5-yr blowdown salvage area of 1,209 ha – this is different from the total area of 1,341.5 ha stated in the text of the Year 10 AR for the year 2005-06 (page 4). Closer scrutiny of the discrepancy leads to the conclusion that the area stated in the text of Year 10 AR is an error with no consequence for the actual numbers reported annually. It is relevant to note that small portion of reported salvage area overlaps with the area originally scheduled for regular harvest, which in effect reduces the harvest level achievement figures slightly.

Much of the analysis presented for harvest volumes already involves harvest area and is equally applicable in this section because of a direct link between the two components, therefore repetition would be redundant.

Overall harvest rates increased from 52% in 1996-2001 term to 60% for the remaining two terms, generally similar to volume.

The level of harvest by forest unit, expressed at the margin of Table 4 as percentage of actual harvest in relation to planned area (3-term average) does not reveal any immediate pattern or concern. This appears to reflect the diversity of the areas selected for harvest and operating conditions as well as changes in the formulation and reporting of forest units, particularly evident between 1996 and 2001. Of note is relatively high level of harvest in the "elite" Pw forest unit across three terms (PN4 and PW1) and average level of harvest in tolerant hardwood selection unit (TH1 and HD1) representing the largest allocation component.

One of the persistent features affecting the overall level of harvest is the practice of bypassing portions of the allocated area for such reasons as access, site sensitivity, operability, merchantability, ownership claims, neighbourhood / land use concerns, timing limitations and others. As observed in the Year 10 AR for the Mazinaw-Lanark FMP 2001-2006 areas bypassed during the course of regular operations accounted for 12% of the forecast harvest area. The potential adjustment to account for this area would hypothetically raise the achievement level from 60% to 72%.

Among the most important impediments to improving the level of harvest is the weakness in the market for low quality material. For the sustainability assessment of the presented harvest level it also seems relevant to notice that 100% utilization in the environment characterized by multiple and diverse, independently operating stakeholders, multiple products and wide variety of constraints could only be achieved at the expense of major disruption to some or all of the operators, because all of them would have to complete their operations in perfect synchrony of all the processes involved precisely scheduled for the end of the planning term, which is clearly unrealistic. Although the optimal level of achievement is disputable, the shortfall can be regarded as a stability buffer preventing several socio-economic hardships.

#### Summary of Renewal and Maintenance

Table 6 summarizes planned and actual renewal, tending and protection operations for the current term and two preceding terms. Planned and actual levels of achievement have been annualized to facilitate comparison between terms. Areas are shown for each activity and summarized for un-even aged & even-aged management, natural & artificial regeneration, site preparation, tending and protection.

Planned renewal areas were derived using TMPM Table 4.19 from the 1996-2001 Mazinaw FMP while Tables FMP-25 from the Mazinaw-Lanark FMP 2001-2006 and 2006-2011 were used to derive planned renewal areas for the corresponding two terms. Table RPFO-7 (1996-2001) was used to report actual renewal areas for the 1996-2001 term. Table AR-7 from Year 10 AR was used for the Mazinaw-Lanark 2001-2006 term. Finally, to-date values from Table AR-7 for the year 2007-08 were used to report renewal areas for the current term.

Clarification: *actual* site preparation figures in Table 6 for the 2001-2006 term are modified from the figure presented in AR-7 in Year 10 Report. Table 6 shows separate annualized figures for Mechanical treatment (167 ha) and Enhanced Harvest (120.4), whereas AR-7 shows only one figure for mechanical treatment (1,436 ha). The two figures in Table 6 still add up to the same total as AR-7 ( $287.2 \text{ ha/yr} * 5 = 1,436 \text{ ha}$ ) but they are split based on actual proportion of two different treatments as applied on the ground. This is done to disentangle the reporting of "enhanced harvesting" operations (not originally forecast in Table FMP-25) in addition to traditional mechanical treatment under Site Preparation category. The removal of undesirable understorey during harvest operations improves the effectiveness of subsequent mechanical site preparation or natural regeneration and in some cases is sufficiently effective without any follow-up treatment.

Table 6 has also been expanded to present a 3-term average percentage of actual treatment in relation to planned area, shown at the margin.

Although achievement in all major categories is below forecast, the analysis of Table 6 shows a general trend of renewal in line with the achievement level of harvest. The 3-term regeneration average of 61% (68%, 68% and 49% for each term respectively) closely resembles the general 60% level of harvest area.

Higher level of achievement in natural regeneration amounting to a 3-term average of 78% (73%, 97% and 69% by term) appears to compensate for a lower level of artificial regeneration averaging 33% (27%, 35% and 37% by term). These differences are mostly attributed to the ongoing verification of actual forest conditions on the ground and the resultant changes recorded in the Forest Operations Prescriptions (FOP) in accordance with the Silvicultural Ground Rules (SGR), reflecting frequent shift away from clearcutting.

Closer scrutiny of Table 6 and Table 4 reveals a trend that characterizes the overall management of Mazinaw-Lanark Forest.

- Artificial regeneration by tree planting is applied on average to 9% of the total harvested area (actual tree planting area relative to actual total harvest). By extending the view back to 1990-1996 term this proportion has held constant for the last two decades and varied from 8% in 1996-2001 to 10% in 2006-2011. The amalgamation with Lanark MU, where this proportion was in the past about two times higher than in Mazinaw (see Lanark CTA) had very little impact on the overall proportion because of small size of Lanark MU.
- Selection (uneven-aged) management for the same time horizon (reaching back to 1990-1996 term) accounted for 31% to 56% of total harvest (1990-1996 and 1996-2001 term respectively).
- The balance of harvest area, i.e. approximately 40-60% (48% during the current term) is accounted for by natural regeneration under shelterwood system in various stages of management, including commercial thinning, and clearcut area.

Although the overall tree planting effort falls short of the forecast with a 3-term average of 43% (47%, 47% and 37% by term), the treatment area and the percentage achievement appear reasonably well aligned with mechanical site preparation averaging 47% (59%, 62% and 27% by term). The differences between site preparation area and tree planting area for individual terms are attributed primarily to instances where natural regeneration was preferred over tree planting option on some mechanically treated areas, but also reflect the reporting effect of the time lapse between these two treatments, which occasionally may last for up to two years.

By far the most commonly planted tree species on Mazinaw-Lanark Forest is white pine. The review of tables AR-8 for Mazinaw-Lanark FMP terms 2001-2006 and 2006-2011, representing the 7-year period from 2001 to 2008, indicates that Pw accounts for 75% of planted trees, followed by Pr (16%), Sw (5%) and Or (4%). The average annual program for that period involved planting of 189,000 trees. Although the corresponding information for the 1996-2001 term is not readily available due to the reporting standards at that time the partial information indicates that Pw represented up to 92% of planted stock and the overall number of planted trees was approximately 100,000 per year. The species mix reflects the commitment to pursuing the stated forest management objective of increasing the presence of Pw on the landscape and maintaining high level of biodiversity.

Overall tending levels were below planned average annual rates with a notable exception of manual cleaning during the 2001-2006 term. The average annual area of manual cleaning increased from 134 ha in 1996-2001 period to 181 ha in 2001-2006 period. The increase in performance of this critical and most expensive treatment in the renewal chain following the establishment of SFL demonstrates the licence holder's commitment to sustainable forest management because cleaning levels are not directly dependent on harvest levels and represent investment in future development of the forest.

The reported underperformance in chemical treatments, both for tending and site preparation purposes (14% and 25% respectively) reflects the preference for non-chemical alternative wherever such alternative is deemed viable. Consequently, many candidate areas for chemical treatment receiving manual cleaning or mechanical site preparation instead.

Low achievement levels for pre-commercial thinning and stand improvement (3-term average of 29% and 37%) can be explained primarily by unrealistically high forecast levels rather than actual implementation. Large majority of these treatments is forecast as operations performed in conjunction with harvest on areas where removal of low quality unmerchantable stems is beneficial for the development of more desirable and better quality trees or for initiating and/or maintaining natural regeneration of desirable species. Because at the time of forecasting in the FMP development process actual conditions on the ground are usually unknown, the forecast is often linked to the anticipated harvest levels of certain forest units where tending treatments are usually applied, such as hardwood selection (HD1 and HD2) or shelterwood forest units PW1, Pine1 and OR1. At the time of prescription development and harvest operations more specific decisions are made relative to the conditions on the ground, which frequently do not justify the treatment or significantly reduce its net area. Based on the Analysis of Forest Unit verification for the period 2001-2004 included in Mazinaw-Lanark FMP 2006-2011 (Table 3.3.2-1, pg. 182) only 65% of the area by forest units originally assigned at the FMP stage are verified in FOP to the same forest units. It is expected that if such analysis was also combined with stages of management, which has direct implication for viability of silvicultural treatments, the discrepancy would likely be considerably larger. This explanation also highlights the link between the pre-commercial thinning / stand improvement achievement levels and harvest levels.

Total annual area of all tending treatments combined shows a decrease from 560.6 ha in 1996-2001 period to 438.0 ha in 2001-2006 and 450.5 ha in the current term. The decrease, attributed mostly to stand improvement activity, reflects decreasing level of Forestry Futures Trust funding, which during 1996-2001 period contributed 45% of the total silvicultural spending on Mazinaw MU and has since declined to 5% in 2001-2006 period and 13% during the current term to date. Lower level of funding usually results in more stringent prioritization of sites selected for treatment.

The cost of silvicultural treatments on the Mazinaw-Lanark Forest is high. Total silvicultural expenditures compared to the total volume harvested during each of the three terms (1996-2001, 2001-2006 and the current term) amount to a price of \$4.76/m<sup>3</sup>, \$4.59/m<sup>3</sup> and \$4.79/m<sup>3</sup> respectively. When adjusted for the Forestry Futures component the rates derived directly from the Forest Renewal Trust Fund (Special Purpose Account) are \$2.62/m<sup>3</sup>, \$4.36/m<sup>3</sup> and \$4.16/m<sup>3</sup> for the three terms. High costs can be attributed to the complexity of forest management associated with the high level of natural diversity, small treatment areas and low yields characteristic of the forest as further complicated by the structure of the local forest industry and various regulatory commitments and constraints.

The analysis of overall achievement level of renewal and tending treatment is also sensitive to the accuracy of forecasts, which deserves additional clarification. Most forecast figures are derived from spatial FRI data that generalizes the area of potential treatment, while most treatments, particularly as it pertains to intensive silviculture, are measured and reported with a high degree of accuracy that results in a major netting down factor, which is further amplified by small size and dispersal of treatment area. In some cases less than 20% of a forecast polygon is actually treated. In the absence of a formal accounting mechanism that would distinguish between net and gross area the total achievement figures cannot be related to the forecast area in a reliable fashion. The end effect is that the forecast figures often appear inadvertently inflated.

### **Summary of Regeneration Assessment**

Table 7 provides a summary of successfully regenerated harvest area in relation to all area harvested between 1995 and 2001 for all forest units combined, effectively covering the period of harvest just before the formal transfer of all management responsibilities from MNR to SFL in 2002. This review period has been selected to achieve two objectives:

- 1) to maintain continuity with the time frame applied in the previous Mazinaw CTA in 2004, which evaluated the period from 1990 to 1995 (Tweed Crown MU), and
- 2) to close the review period in line with Lanark CTA at the end of separate accounting for Mazinaw and Lanark MU while coinciding with the beginning of amalgamated forest management planning and

reporting, which commenced on April 1, 2001 with the Mazinaw-Lanark FMP 2001-2006. This will allow to move forward in the future analyses starting at the most logical date.

The time lag of 7 to 13 years between the original year of harvest (1995 to 2001) and the latest potential date of regeneration assessment (2008) provides sufficient time for majority of harvested areas to be assessed if the regeneration standards of the time of harvest were to be applied. This harvest period does not correspond strictly with the 1996-2001 CTA term referenced throughout this report since harvest for 1995-96 had to be added to the 1996-2001 data in order obtain a complete base for comparison.

The total area harvested from 1996 to 2001 was obtained from RPFO-1 (1996-2001). The area harvested during the additional year 1995-96 was obtained from Annual Work Report (AWR) for that year. The area harvested under even-aged management presented in Table 7 shows *assessable* area only, which includes all clearcut and all shelterwood seed cut but does not include preparatory cut, various removal cut stages and commercial thinning. By including only the type of harvest that under current standards, and even more so under previous standards, requires formal regeneration assessments and therefore was targeted for assessments, the analysis is narrowed down to comparable figures only. For reference the entire area of even-aged harvest (all clearcut and all shelterwood harvest regardless of stage of management) is presented in a box on the right hand side of the table. The difference of 804 ha, not regarded as assessable, includes 171 ha (21%) of removal cut and 633 ha (79%) of preparatory cut, which in the old terminology most likely represents substantial component of commercial thinning. Clearcut harvest for the 6-year period was reported on 1,355 ha, representing 18% of the total harvest on Mazinaw MU and 40% of the assessable even-aged area. This leaves 60% of the assessable even-aged area in shelterwood seed cut category. The entire area reported as selection harvest for the 6-year period is presented as *assessable* based on current standards, however, as indicated in further discussion selection harvest traditionally did not require assessments.

The extent of this six-year harvest area that was surveyed for regeneration success was determined by reviewing actual survey records from 2002 to 2008. After reviewing the information presented in RPFO-8 for the period 1996-2001, the findings presented in CTA 2004 ("no surveys were conducted by MNR from 1995 to 1999") and the status of survey records carried out by Mazinaw-Lanark Forest Inc. between 1999 and 2002 it was concluded that the only assessments relevant for the review period 1995 to 2001 are those conducted by Mazinaw-Lanark Forest Inc. in 2002 and later, up to March 31, 2009. This is the only section of CTA where actual results from year 3 of the current FMP are used because the data from the assessments carried out during the 2008-09 year was available in time for preparation of the report.

Total harvest area in Table 7 is split roughly equally between even-aged and uneven-aged management: 3,323 and 3,018 ha respectively. Of the surveyed even-aged area 53.8% was declared successfully regenerated while 90.5% of uneven-aged area met the selection management standards. The results, particularly for the even-aged portion, appear to reflect more on the formal aspects of the process than on forest development on the ground. To reach this conclusion several factors were considered, most notably the evolution of standards and the nature of Mazinaw-Lanark Forest itself.

Until the implementation of Silvicultural Effectiveness Monitoring Manual for Ontario (SEMMO) in 2001 the standards defining what areas should undergo free-to-grow assessments were preoccupied with clearcut and shelterwood areas treated for artificial regeneration and evaluating NSR. Since both of these categories represent very small portion of the Mazinaw forest as described in the Summary of Area Under Management section and Renewal & Maintenance section of this report, the past assessment commitments were limited and relatively well defined. For example the Forecast of FTG Assessment in the Mazinaw FMP 1996-2001 (Table 4.22) included 808 ha of *Treated* area (planted) and 4,108 ha of *Untreated* area, which, as estimated in the plan text, includes "approximately 1,154 ha of shelterwood (seed cuts) and a small proportion of clearcut areas" (the remainder was part of a long term effort to evaluating productivity of B&S area identified in FRI from 1978 photography with no direct link to harvest records). This means that the total area of approximately 2,000 ha scheduled for assessments represented 39% of harvest area reported for the preceding term 1990-1995 or 24% of harvest reported five years earlier for the term 1985-1990. Part of these commitments was transferred to SFL in 2002 in the form of a document "Silvicultural Responsibilities on Class X, Y and Z Lands" protocol" where 2,245

ha were identified for attention, 87% of which was classified as category Z (no obligation to meet silvicultural standards). Until the implementation of SEMMO in 2001 selection management was never included in the assessment program on the assumption of permanent FTG status. This description highlights the fact that prior to 2001 there was no standard or commitment that would automatically qualify all prior harvest on Mazinaw MU for regeneration assessments. The extent of surveys conducted since 2001 was largely driven by formal commitments transferred from MNR to SFL and by the direction of SEMMO for harvest that took place during the Mazinaw-Lanark Forest Inc. involvement beginning practically in 1999. The level of survey effort reflects on these circumstances. Examples of area that was not surveyed because there was no standard or formal commitment to trigger the survey include 41 ha clearcut in Ashby Twp. harvested in 1997 (7-CC-97) or 78 ha clearcut in Grimsthorpe Twp. harvested in 1995 (3-CC-95). Based on aerial photography and field observations both areas appear to be well stocked with a combination of residual overstorey and vigorous regeneration.

The time lapse required between harvest and FTG status has direct implication for the level of survey achievement. The time lapse prescribed for even-aged areas on Mazinaw MU until 2001 varied from 3 to 9 years depending on forest unit / working group with most common duration of 7 years, which again points to the original focus on planted stock. This would theoretically capture all relevant harvest that took place prior to 2001 for assessments by 2008, however the results of assessments have consistently shown that longer time is required for several major species such as Pw, Pr, Or, He and most tolerant hardwoods to reach FTG height and stocking standards, particularly with involvement of natural regeneration. This finding has already been incorporated in the silvicultural ground rules (SGR) for FMP 2001-2006 and evolved further in the current FMP, where most common time to FTG is established at 10 years and for some forest units extends to 15 and 20 years (HE1 and LC1). In order to accommodate the observed regeneration development on the ground the timing of assessments was frequently delayed beyond the original standards. Unlike for even-aged management, no time lapse is required between harvest and assessment for selection management standards. This would explain the higher proportion of uneven-aged harvest area surveyed, simply because these areas were available at any time.

The silvicultural success level of 90.5% for un-even aged management appears satisfactory. The interpretation of assessment results required adjustment with regard to the past SGR's (including FMP 1996-2001), which essentially applied traditional regeneration stocking as FTG standards for selection managed stands (with additional parameters). This approach proved incompatible with the stand structure that develops as desired component of selection management, because regeneration, defined by 10 cm DBH limit does not represent a distinct canopy comparable to open clearcut managed under even-aged system. In keeping with the intent of the past standards, the results of assessments in selection stands were interpreted using the current concept of management standards (as opposed to regeneration standards) where basal area, quality improvement, stand structure and species composition are considered as a combined set of criteria. The 9.5% shortfall from 100% of "successful regeneration" in the uneven-aged column in Table 7 represents those stands that significantly missed management standards defined according to these criteria.

The concerns identified most frequently in the assessments of selection harvest areas include:

- Incomplete removal of UGS stems designated for harvest, which affects the quality improvement required by management standards (usually involves small diameter stems). This is often accompanied by missed basal area target (too high) and stand structure distortion involving increased component of polewood [examples Grimsthorpe DC3-06-05 comp 04, 06, 15, DC3-06-04 comp. 19, 20]. To a large degree these findings reflect market conditions and silvicultural realities in stands where silvicultural standards are introduced for the first time in their development.
- High component of ironwood in the understorey. [example – DC3-06-09 comp 01]

Among the concerns listed above the most troublesome appears to be the spread of ironwood in the understorey because there is currently no easy remedy for this competitor. The problem seems to be confirmed through the Forest Operations Prescriptions surveys on areas currently scheduled for harvest that were cut about 25-35 years ago. Mazinaw-Lanark Forest Inc. is currently exploring several options to address this issue that has also detrimental impact on the development of red oak regeneration, including aggressive tending program, chemical treatment, mechanical site preparation and prescribed burning.

Careful analysis of the 53.8% regeneration success in even-aged management suggests that at least 65% of the remaining area that did not meet the standards can be attributed to two major factors described in more detail further in this report:

- Past harvest reporting standards and practices
- Incompatibility of the assessment methodology (standard) with complex stand structure commonly encountered on harvested areas.

Additional factors include past harvest practices and insufficient time needed for natural regeneration to develop.

Consequently large majority of the area that was not formally declared as successfully regenerated still supports viable forest cover and effectively contributes to the sustainable growth in the future.

Table E shows the summary of the assessments for even-aged management by target forest units. The forest units originally identified as targets in the surveys are grouped into nine general categories to facilitate the interpretation and to link with the forest units definition in the current as well as the next FMP. In many cases target forest unit could not be derived from the original prescriptions and was extrapolated. The results are presented at two levels: the ratio of *regeneration success* relative to the total area assessed, where regeneration was FTG to any of the standards of the day, and *silvicultural success*, where the FTG regeneration was consistent with the original target forest unit.

**Table E.**

**Regeneration Status on Assessed Even-aged Harvest Area 1995-2001 by target forest unit.**

Target Forest Unit (general grouping)	Target Forest Units (as reported)	Total Assessed [ha]	Declared Free-To-Grow [ha]	Regen. success (FTG /total)	Silvicult. success (FTG-on target /total)	FU as % of total assessed area
Conifer mixed CC	CM1, SP1	42.4	34.1	80%	80%	3%
Hardwood shelf.	TH2, HD4	56.2	29.9	53%	18%	4%
Hemlock shelf.	HE, HE1	83.6	54.8	66%	17%	6%
Intolerant Hwd. CC	INT, PB1, PO1	123.1	108.5	88%	74%	9%
Mixedwood shelf.	MW2	70.0	49.5	71%	68%	5%
Mixedwood CC	MW1	27.0	27.0	100%	100%	2%
Oak shelf.	OH, OR1	189.4	11.7	6%	2%	14%
White Pine shelf.	PN4, PW1	764.8	430.9	56%	42%	55%
RedPine shelf.	PINE1	43.5	6.4	15%	12%	3%
<b>Total</b>		<b>1,399.9</b>	<b>752.8</b>	<b>54%</b>	<b>40%</b>	<b>100%</b>

*Silvicultural success = also Regeneration success*

Table E shows that the largest portion of the area assessed involves white pine as a target species, followed by oak. This is consistent with generally very high proportion of pine forest in the area harvested during the 1995-2001 period (Table 4), followed by oak harvest. Pine target area also involves the portion of clearcut area where the objective was to establish pine forest through artificial regeneration. Table E also shows that Pw represents the largest successfully regenerated area overall.

Unsuccessful Pw regeneration can be attributed to various causes, including:

- Errors and inconsistencies in the past reporting standards and practices, as described further in this section, leading to the reduction of FTG area [example: Effingham DC1-06-01 part H & C].
- Delayed development or absence of natural regeneration, usually associated with a mismatch between the timing of harvest and irregular seed crop resulting in forest floor being captured by undesirable competition species. [Raindrop Lk DC1-08-27 part E]
- Incomplete utilization on some shelterwood and clearcut areas, usually resulting in polewood dominated residual stands, which effectively hinders follow-up treatments while providing suitable

condition for balsam fir, soft maple and poplar understorey or slows down the development of Pw even if it is established naturally. This category also includes bypass patches reported as harvested. [example: DC1-04-019 reported in 2006]

- Scale of operations on highly diverse landscape: small isolated patches of pine shelterwood harvest usually surrounded by other forest type or difficult to access were often left untreated and failed to regenerate naturally to target species. [Ashby DC1-05-007]

Very low success rate on area managed for oak (2% silvicultural success) reflects a well recognized problem with regenerating this species on Mazinaw-Lanark Forest. Despite high profile attributed to oak in various FMP objectives (biodiversity, wildlife habitat, economic objectives) oak regeneration remains an unresolved problem. Assessments indicate that one of the more persistent problems associated with failed oak regeneration, to some degree also affecting white pine, is wide spread, aggressive propagation of ironwood, which also remains largely unsolved. Mazinaw-Lanark Forest Inc. continues to pursue various treatment options in an attempt to boost oak regeneration success, such as scarification, tree planting, seeding, intensive tending, group shelterwood and prescribed burning. A very evident pattern of unpredictability has emerged with various cases of successful regeneration of oak on areas where it was not expected and not planned for and the opposite results on some of the areas scheduled for oak regeneration. It is also very evident that successful oak regeneration requires a synchronised control of several factors beginning with timing of harvest operations coinciding with bumper seed crop. Extensive evidence gained through the assessment process seems to indicate that the expectation of recreating and maintaining large contingent of solid oak stands on the management unit may be unrealistic. This finding will be considered in the silvicultural strategy currently under development for FMP 2011-2021.

Low success rate for PINE1 target involves attempts to regenerate red pine (Pr) on two specific areas: one where treatment delays and operational mistakes on clearcut led to slower than expected development of planted stock, still expected to reach FTG status [DC1-06-02], and one managed for natural regeneration under shelterwood conditions where soil disturbance and harvest intensity turned out to be too light with no seed year, resulting in lack of regeneration [DC1-07-1]. These observations have been already incorporated into the current strategy to increase red pine component in tree planting program and to keep promoting natural regeneration of this important species.

Silvicultural success on areas targeting hemlock is also very low (17%) and usually limited to areas where He has been already established naturally before harvest, the balance regenerated most commonly to tolerant hardwood [example DC1-06-001]. As a result the overall regeneration success on these areas is much higher at 66%. The difficulty with consistent regeneration of hemlock under shelterwood management has been recognized in the past and led to change in the silvicultural strategy for FMP 2011 where hemlock is proposed to be managed under uneven-aged system.

High proportion of successful regeneration of clearcut areas targeting intolerant hardwood (poplar & white birch) and mixedwood (typically poplar, white birch, soft maple and component of other species) represents silvicultural option of extensive management utilizing natural regeneration.

One of the more significant, although temporary factors affecting the assessment results is the issue of **past reporting and prescription standards**. Until 2001, which generally coincides with implementation of various new standards (FOP, forest information, silvicultural effectiveness monitoring) and technological advances in data management, many harvested areas were recorded with the forest unit and stage of management assigned to them in the FMP, not necessarily based on field verified data. Field verified information may have been recorded in prescriptions of various formats with insufficient clarity as to the original forest unit or objectives and targets. At the time of regeneration assessment all these inconsistencies created a mismatch between formal designation (that triggered the assessment) and reality on the ground. Consequently, as an example, harvest reported as PN4 seed-cut, therefore assessed for FTG 7-8 years after harvest "failed" because the actual stand condition, consistent with prescription, was closer to preparatory cut and should not require FTG assessment. Although this type of problem accounts for a significant portion of the area reported in Table E as not successful, it is worth noting that the current standards and data management techniques should practically eliminate this concern in future analyses.

Smaller and also temporary potential distortion factor in the assessment results is the technological shift from the old paper based mapping and area calculation methods used during the 1995-2001 period to digital mapping and GPS navigation used currently in the assessment process. The extent of this effect is unknown.

**Assessment methodology** currently used in Mazinaw-Lanark Forest is tailored to the requirements developed and included by MNR in SEMMO and effectively (although not explicitly) establishing Silvicultural Treatment, Assessment and Reporting System (STARS) as de facto standard to be followed. A long standing concern identified in the process of regeneration assessments in Mazinaw-Lanark Forest is the difficulty of this system in accommodating complex multi-storey, multi-species, variable cohort stand structure with irregular distribution of trees at various sizes and stages of growth where rigid separation of "regeneration" (stems below 10 cm DBH) and "overstorey" (10 cm +), assessed against simplified height and competition criteria does not allow to adequately capture and interpret the development of the forest, nor does it allow for the results to be meaningfully integrated with FRI and evolving modeling capacity. This concern is very evident on shelterwood areas where patches of underplanting or natural regeneration stand out as very successful even by standard assessment method but surveyed across larger polygons they cannot outweigh legitimately different conditions on the remaining area. The end result is frequent "failure in numbers" on areas that are well stocked and healthy. It is recognized that the system is suitable for clearcut sites where uniform conditions prevail, however, it is believed that on majority of Mazinaw-Lanark sites a more refined system is required.

Assessments presented in this report (total of 3,255 ha pertaining to the harvest that took place between 1995 and 2001) represent only 47% of all FTG assessments carried out by Mazinaw-Lanark Forest Inc. during the same data collection period of 2001 – 2009. In addition to the mandatory assessments reported annually a significant area is evaluated routinely for various purposes, beginning with the extensive verification for Forest Operations Prescriptions, regular tree marking audits, silvicultural component of harvest monitoring, post-harvest assessments for site preparation, tree planting assessments, assessments for tending and for progress of stand development prior to final assessments. It has been observed that in many cases monitoring is justified beyond formal FTG stage. Although these additional assessments are not formally reported against FMP targets, they are recorded in various forms with various levels of detail and cover an estimated area of about 2,500 to 3,500 ha annually.

All data and observations generated through the assessment program are the cornerstone of the expanding knowledge base specific to Mazinaw-Lanark Forest conditions and applied continually in the process of adaptive management. Given the temporary nature of some of the problems presented above as well as major and continuous improvements introduced since 2001 in silviculture and data maintenance it is expected that assessment results for the harvest term 2001-2006 will be considerably better than those presented in the current report.

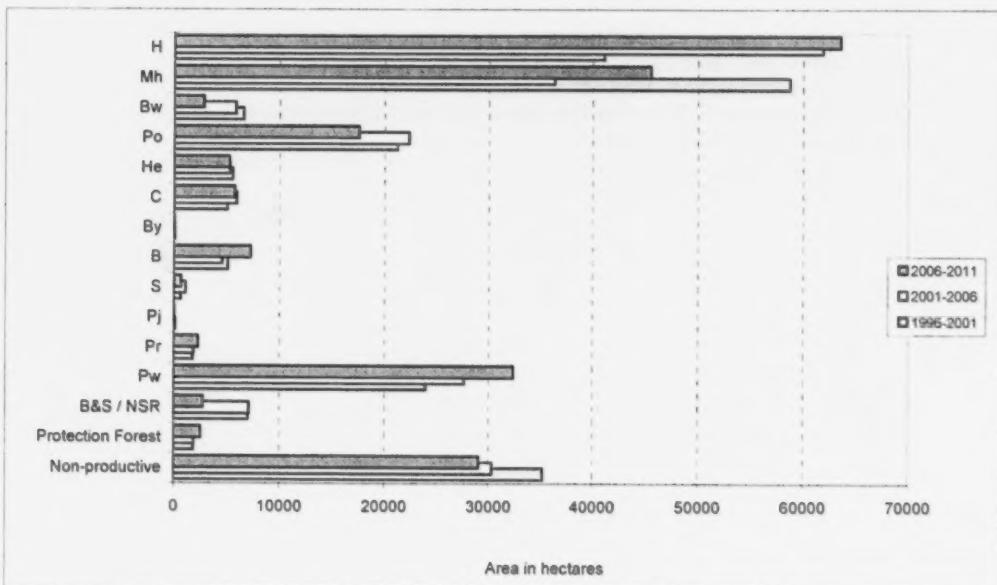
**2009 Independent Forest Audit**

**Table 1 - Summary of Total Area Under Management**

**Past and Current Plans - Crown Managed**

MU: Mazinaw (1996-2001) and Mazinaw-Lanark (2001-2011)

Land Type	Plan Term	Area in hectares		
		Past Plans		Current
		1996-2001	2001-2006	2006-2011
Non-Forested		-	-	-
Other Land		1,865	4,206	2,419
Forested				
Non-productive		35,229	30,356	29,100
Productive		181,268	182,424	189,798
Protection		1,883	1,903	2,591
Production Forest				
B&S		7,009	7,117	2,777
NSR/Depleted		2,396	483	1,172
Working Group	WG's included			
Pw	Pw	23,958	27,639	32,374
Pr	Pr	1,813	1,872	2,314
Pj	Pj+Ps	133	41	42
S	Sb+Sw	662	1,124	698
B	B	5,074	4,554	7,249
By	By	70	62	53
C	Ce+L+Oc	5,034	5,933	5,769
He	He	5,592	5,297	5,277
Po	Po	21,232	22,347	17,571
Bw	Bw	6,578	5,856	2,844
Mh	Mh	58,726	36,342	45,546
H	O+OH+H+Ms+A	41,108	61,853	63,521
Total Production Forest		179,385	180,521	187,208
Total Forested Land		216,497	212,780	218,897



Source: FMPM FMP - 1 and 2  
TMPM Table - 4.8.2

Table 2 - DESCRIPTION OF FOREST UNITS (FMP-8)

Forest Unit Code	Forest Type	Main Working Group	Site Type(s)	Silvicultural System	F&M Parameters & Criteria	Additional Information	
<b>Marine - Larch (FMP-801)</b>							
PW1	Pe-Pt-Qn-Usd	Conifer	White Pine	Econotes 11, 12, 14, 20, 21, 25, 27, 30	Shelterwood 4-stage	$Pw > Pr$ and $Pr > Pb$ and $Pw > Sw$ and $Pw > Pj$ and $Pw > Cr$ and $(Pr + Pb) > Qr > 8$ and $Stk > 7$	Stands with high concentration of white pine
Pw1	PePtM2	Conifer	White Pine (Red Pine)	Econotes 11, 12, 14, 17, 18, 20, 21, 22, 23, 4, 26, 27, 28, 29, 30	Shelterwood 2-stage	$Pw > Pr$ and $Pr > Pb$ and $Pw > Ca$ and $Pw > Qr$ and $Pw > Sb$ and $Pw > Ce$ and $Pr > Pb$ and $(Pw + Pb) > 3$ and $Pr + Pb + Sw + Qr + Sb + C + Pj > 5$ and $Stk > 6$ or $Pw + Pr + He + Sw + Qr + Sb + C + Pj > 7$ or $FU > Pt^*$	Stands with lower concentration of white pine, usually lower stocking than PW1, includes red pine stands
HE1	HeUs4	Conifer	Hemlock	Econotes 23, 24, 25, 26, 27, 28, 30	Shelterwood 4-stage	$He > 5$	Stands dominated by Hemlock
OB1	Qn-Qp-Pm-U3	Tolerant Hardwood	Oak	Econotes 14, 17, 18, 19, 20, 21, 22, 23, 24, 3, 26, 27, 28, 29, 30, 35	Shelterwood 3-stage	$Qr > Pw$ and $Qr > Pr$ and $Qr > He$ and $Qr > Sw + d$ $Qr > 4$ and $Qr + Pb + Pr + He + Sw > 8$	Stands composed of red oak in sufficient quantity to warrant management for oak
LH1	Low Hlnd Sel	Tolerant Hardwood	Ash	Econotes 32, 33, 34, 35	Selection	$Ce + La + Sb + Ab + Bw > 5$ and $Ab + El + Mls + Bw + Sb + Ce + a + Bf$	Low lying hardwood species found on moist to wet sites
LC1	All low Con	Conifer	Cedar (Larch)	Econotes 16, 22, 23, 30, 31, 32, 33, 34	Clearcut	$Ce + La + Sb + Ab + Bw > 5$	Low lying conifer species found on moist to wet sites
HD1	Tol Hlnd Sel	Tolerant Hardwood	Hard Maple	Econotes 14, 15, 17, 23, 24, 25, 26, 27, 28, 29	Selection	$Mn + Ab + Aw + Bd + Be + Ch + Ew + Ir + Qr + Yb + Ow + Ob + He > 5$ and $Po + Bw + Bf < 3$ and $(Sc = 'X' OR Sc = '1' OR Sc = '2')$ and $Age > 60$ and $Stk + > 6$	Mature tolerant hardwoods on good sites
HD2	Tol Hlnd Fst Sel	Tolerant Hardwood	Hard Maple	Econotes 14, 15, 16, 17, 18, 20, 23, 24, 25, 2	Selection	$Mn + Ab + Aw + Bd + Be + Ch + Ew + Ir + Qr + Yb + Ow + Ob + He > 5$ and $Po + Bw + Bf < 3$ and $(Sc = 'X' OR Sc = '1' OR Sc = '2')$ and $Age > 60$ and $Stk > 6$ and $Pr > 5$	Younger tolerant hardwood stands that require additional silvicultural work, usually managed for future HD1
HD4	Qn-Tolhd-U3	Tolerant Hardwood	Hard Maple (Oak, Red Maple)	Econotes 14, 17, 23, 24, 25, 26, 27, 28, 29, 30	Shelterwood 3-stage	$Mn + Ab + Aw + Bd + Be + Ch + Ew + Ir + Qr + Yb + Ow + Ob + He > 5$ and $Pr > 4$	Tolerant hardwood stands unsuitable for selection management, sometimes on poor sites
CM1	Com Upd	Conifer	Balsam Fir (White Pine, Cedar)	Econotes 11, 12, 13, 14, 15, 16, 17, 18, 19, 0, 21, 22, 27, 30, 32, 33	Clearcut	$Pw + Pr + Pb + Ps + Sb + Sw + Ce + La + Oc + He + Bf > 7$	Conifer mixedwood stands pre-dominantly composed of balsam fir, includes spruce stands
NT	Poplar/Bw	Intolerant Hardwood	Poplar	Econotes 11, 12, 13, 14, 16, 17, 18, 19, 20, 2	Clearcut	$Po + Bw + Ms > 6$ and $Po + Bw + Ms$	Stands dominated by poplar and/or white birch
MW2	Mixed U3	Mixedwood	Red Maple (White Pine, Oak)	All econotes except 15, 16 & 31	Shelterwood 3-stage	$Pw + Qr + He + Sw + Mn + Bd + Bf + Aw + Po + Bw + Bf$	Mixedwood stands of extremely variable composition and structure that require flexible silvicultural management
MW1	Mixed wood	Mixedwood	Red Maple (Poplar Balsam Fir)	All econotes except 15 & 31	Clearcut	everything else	Mixedwood stands not suitable for shelterwood system
<b>Marine - Larch (FMP-801)</b>							
PW1	Pe-Pt-Qn-Usd	Conifer	White Pine	Econotes 11, 12, 14, 20, 21, 23, 27, 30	Shelterwood	$Pw > Pr$ and $Pr > Pb$ and $Pw > Sw + d$ and $Pw > Pj$ and $Pw > Cr$ and $(Pr + Pb) > Qr > 8$ and $Stk > 7$	Stands where the main tree species is white pine
Pw1	PePtM2	Conifer	White Pine	Econotes 11, 12, 14, 17, 18, 20, 21, 22, 23, 24, 4, 26, 27, 28, 29, 30	Shelterwood	$Pw > Pr$ and $Pr > Pb$ and $Pw > Sw + d$ and $Pw > Qr$ and $Pw > Sb$ and $Pw > Ce + Pb + Qr > 3$ and $(Pr + Pb) > 3$ and $Pr + Pb + He + Sw + Qr + Sb + C + Pj > 5$ and $Stk > 6$ or $Pr + Pb + He + Sw + Qr + Sb + C + Pj > 7$ or $FU > Pt^*$	Stands composed of white and red pine with low stocking
HE1	HeUs4	Conifer	Hemlock	Econotes 23, 24, 25, 26, 27, 28, 30	Shelterwood	$He > 5$	Stands Composed of 50% Hemlock
OR1	Qn-Qp-Pm-U3	Tolerant Hardwood	Dak Red/White	Econotes 14, 17, 18, 19, 20, 21, 22, 23, 24, 2	Shelterwood	$Qr > Pr$ and $Qr > Pb$ and $Qr > He$ and $Qr > Sw + d$ $Qr > 3$ and $Qr + Pb + Pr + He + Sw > 5$	Stands composed of red oak and oak associated species
LH1	Low Hlnd Sel	Tolerant Hardwood	Ash	Econotes 32, 33, 34, 35	Selection	$Ce + La + Sb + Ab + Ew > 5$ and $Ab + El + Mls + Bw + Yb + Ds + Ce + Bf$	Low lying hardwood species found on moist to wet sites
LC1	All low Con	Conifer	Cedar	Econotes 16, 21, 22, 30, 31, 32, 33, 34	Clearcut	$Ce + La + Sb + Ab + Ew > 5$ and $Sw + Bw + Bf + Ce + C$	Low lying conifer species found on moist to wet sites
HD1	Tol Hlnd Sel	Tolerant Hardwood	Hard Maple	Econotes 14, 15, 16, 17, 23, 24, 25, 26, 27, 28, 29	Selection	$Mn + Ab + Aw + Bd + Be + Ch + Ew + Ir + Qr + Yb + Ow + Ob + He > 5$ and $Po + Bw + Bf < 3$ and $(Sc = 'X' OR Sc = '1' OR Sc = '2')$ and $Age > 60$ and $Stk > 6$	Mature tolerant hardwoods on good sites
HD2	Tol Hlnd Fst Sel	Tolerant Hardwood	Hard Maple	Econotes 14, 15, 16, 17, 18, 20, 23, 24, 25, 2	Selection	$Mn + Ab + Aw + Bd + Be + Ch + Ew + Ir + Qr + Yb + Ow + Ob + He > 5$ and $(Sc = 'X' OR Sc = '1' OR Sc = '2')$ and $Age > 60$ and $Stk > 6$	Younger tolerant hardwood stands that require silvicultural work (Stand Improvement)
HD4	Qn-Tolhd-U3	Tolerant Hardwood	Hard Maple	Econotes 14, 17, 23, 24, 25, 26, 27, 28, 29, 30	Shelterwood	$Mn + Ab + Aw + Bd + Be + Ch + Ew + Ir + Qr + Yb + Ow + Ob + He > 5$ or $Yb > 4$	Tolerant hardwood stands on poor sites
CM1	Com Upd	Conifer	Other Conifer	Econotes 11, 12, 13, 14, 15, 16, 17, 18, 19, 0, 21, 22, 27, 30, 32, 33	Clearcut	$Pw + Pr + Pb + Ps + Sb + Sw + Ce + La + Oc + He + Bf > 7$	Conifer mixedwood stands pre-dominantly composed of balsam fir and spruce
NT	Poplar/Bw	Intolerant Hardwood	Poplar	Econotes 11, 12, 13, 14, 16, 17, 18, 19, 20, 2	Clearcut	$Po + Bw + Ms > 6$ and $Po + Bw + Ms$	Stands composed predominantly of poplar and white birch mixed with small amounts of red maple
MW2	Mixed U3	Mixedwood	Other hardwood	Econotes 11, 12, 13, 14, 17, 18, 19, 20, 21, 2, 23, 24, 25, 26, 27, 28, 29, 30, 32, 33, 34	Shelterwood	$Pw + Qr + He + Sw + Mn + Bd + Aw + Po + Bw + Bf$	Mixedwood stands that will be managed under the shelterwood silvicultural system
MW1	Mixed wood	Mixedwood	Poplar	Econotes 11, 12, 13, 14, 16, 17, 18, 19, 20, 2	Clearcut	everything else	Mixedwood stands that will be managed under the clearcut silvicultural system
<b>Marine - Larch (FMP-801)</b>							
B1	B1	Conifer	Bl (Pw, Pr, Sw)	Clearcut	Wg + B	Some balsam fir stands will be included in the temporary forest unit PFI for conversion to more productive and desirable tree species such as pine or spruce	
BW1	BW1	Intolerant Hardwood	Bw	Clearcut	WG + Bw	White birch stands managed under the clearcut system Some white birch stands will be included in the temporary forest unit PFI for conversion to more productive and desirable tree species such as white or red pine	
HE1	HE1	Conifer	Ha	Shelterwood	Wg + Ha	Hemlock stands managed under the 1-cut uniform shelterwood system	
OC1	OC1	Conifer	Co. I.	Clearcut	WG + Co. I.	White cedar and larch stands managed under the strip clearcut system	
OR1	OR1	Tolerant Hardwood	O	Shelterwood	WG + O	Oak stands managed under the uniform or group shelterwood systems	
PB1	PB1	Conifer	B, Bw, Po	Clearcut	See B1, BW1 & PO1	A temporary forest unit for poplar, birch and balsam stands that will be converted to more productive and desirable tree species	
PNO	PNO	Conifer	Pw, Pt	Clearcut	WG + Pw, Pr (Pw, Pr, Sw & He less than 40% or 12m/ha)	White and red pine stands with primary species (Pw, Pr, Sw & He) less than 40% species composition or 12 m/ha basal area managed under the wet tree system	
PN2	PN2	Conifer	Pr	Shelterwood	WG + Pr	Red pine stands managed under the 2-cut uniform shelterwood system	
PN4	PN4	Conifer	Pw	Shelterwood	WG + Pw	White pine stands managed under the 4-cut uniform shelterwood system	
PO1	PO1	Intolerant Hardwood	Po	Clearcut	WG + Po	Poplar stands managed under the clearcut system. Some poplar stands will be included in the temporary forest unit PFI for conversion to more productive and desirable tree species such as white or red pine	
SP1	SP1	Conifer	Sp	Clearcut	WG + Sp	Spruce stands managed under the strip clearcut system	
TH1	TH1	Tolerant Hardwood	Mh, Bw, Bd	Selection	WG + Mh, Bw, Bd	Tolerant hardwood stands managed under the selection system	
TH2	TH2	Tolerant Hardwood	Mh	Shelterwood	WG + Mh	Maple stands managed under the 2 to 1-cut uniform shelterwood system	

**2009 Independent Forest Audit**

**Table 3 - Summary of Planned & Actual Harvest Volumes**

MU: Mazinaw (1996-2001) and Mazinaw-Lanark (2001-2011)

**Average Planned Annual Harvest Volumes**

Volumes are Annualized for the indicated period

Species	Volume in cubic metres (m <sup>3</sup> )		
	Past Plans		Current
	1996-2001	2001-2006	2006-2011
Pw	15,892	18,617.7	28,976.2
Pr	4,600	3,321.6	4,628.8
Pj	-	-	-
Sb	-	-	32.0
Sw	4,222	3,526.0	4,037.2
He	5,348	5,338.9	5,117.4
Bf	2,588	4,051.9	8,844.0
Ce	806	826.8	1,167.2
Ls	-	5.2	1.6
Po	37,107	36,981.4	39,509.4
Bw	10,979	10,089.3	8,348.6
Mh	38,350	24,943.3	21,496.8
OH	O, Bd, Be, Oh, By, H, A, Ew, Ma	17,359	34,389.1
		-	21,054.0
Total Planned Volumes	137,251.4	142,091.3	143,213.2

Source:

TMP 4 18.1

FMP-2I

FMP-2I

(1996-2001)

(2001-2006)

(2006-2011)

RPFO-4

**Actual TREES Harvest Volumes**

Volumes are Annualized for the indicated period

Species	Volume in cubic metres (m <sup>3</sup> )		
	Past Plans		Current
	1996-2001	2001-2006	2006-2011
Pw	12,383.0	16,815.5	13,539.0
Pr	1,749.0	3,146.6	4,028.0
Pj	-	-	-
Sb	-	-	-
Sw	1,391.4	912.1	1,346.0
He	761.8	1,786.4	2,077.0
Bf	356.0	451.3	501.0
Ce	94.0	213.9	176.5
La	Oa (1990-1995 only)	-	5.8
Po	25,835.2	19,750.8	22,873.0
Bw	2,968.8	5,135.1	4,928.0
Mh	20,080.0	29,963.4	34,537.0
OH	O, Or, Bd, Be, Oh, By, H, Cb, Bn, A, Ew	14,441.1	17,126.8
		-	14,474.5
Total Actual Volumes	80,060.3	95,307.7	98,480.0

Source:

\*\*RPFO-4

10 yr AR-4

AR-4

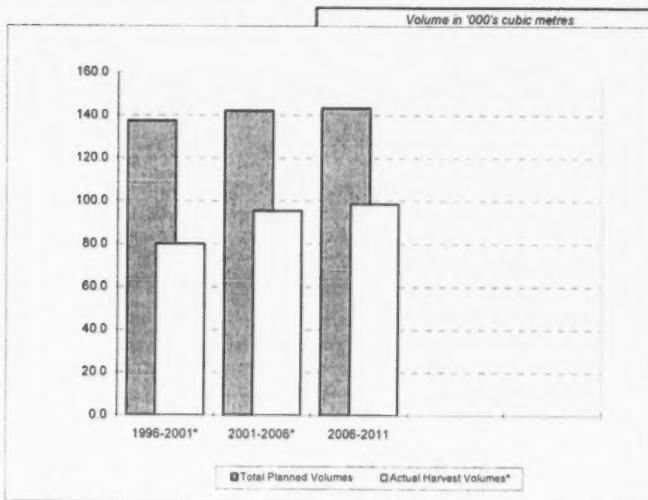
(1996-2001)

2001-2006

(2006-2007 &

2007-2008)

\*\* Addition error within RPFO-4 results in different total actual volume reported for 1996-2001



2009 Independent Forest Audit

**Table 4 - Summary of Planned & Actual Depletion Area  
Past and Current Plans.**

MU: Mazinaw (1996-2001) and Mazinaw-Lanark (2001-2011)

Area is Annualized for the indicated period

Plan Term	Planned Annual Harvest Area			Actual Depletion Area				3-term avg vs. Planned Harvest %	
	Area in hectares		Current	Area in hectares		Current			
	Past Plans	2001-2006		1996-2001	2001-2006	2006-2011			
Forest Unit	1996-2001	2001-2006	2006-2011	Harvest	Natural	Harvest	Natural	Harvest	
2006-2011									
PW1			115			71	-		
Pine1			359			108	-	62%	
HE1			14			42	-	30%	
OR1			202			124	-	295%	
LH1			8			2	0	61%	
LC1			0			-	-	20%	
HD1			725			341	27	47%	
HD2			412			151	10	37%	
HD4			97			132	-	136%	
CM1			20			4	-	21%	
INT			242			101	1	42%	
MW2			174			135	-	78%	
MW1			156			96	3	61%	
								52%	
2001-2006									
PW1			48			48	3		
Pine1			295			180	59		
HE1			37			5	1	98%	
OR1			266			146	50	61%	
LH1			1			0	1	13%	
LC1			0			0	1	55%	
HD1			567			385	24	12%	
HD2			441			232	14	9%	
HD4			48			43	11	68%	
CM1			1			0	1	53%	
INT			100			29	22	90%	
MW2			127			144	14	4%	
MW1			244			100	29	26%	
								113%	
								41%	
1996-2001								60%	
BI			85			12	-		
BW1			100			35	-	14%	
HE1			98			32	-	35%	
OC1			59			5	-	32%	
OR1			145			102	-	8%	
PB1			89			55	-	70%	
PNO			65			38	-	61%	
PN2			18			2	-	59%	
PN4			354			290	-	12%	
PO1			253			97	-	82%	
SP1			4			1	-	38%	
TH1			849			604	1	37%	
TH2			63			30	-	71%	
Total Area	2,183	2,184	2,523	1,302	1	1,312	242	1,308	
Source:	RPF0-1	FMP-1B	FMP-1B	RPF0-1	RPF0-1	10yr AR-1	AR-1 (each year from 2001-2006)	AR-1 (2006-2007 & 2007-2008)	
	*Table 4.15 (1996-2001)	(2001-2006)	(2006-2011)	(1996-2001)	(1996-2001)	(2001-2006)	(2006-2007 & 2007-2008)	(2006-2007 & 2007-2008)	

\* Total area for PN4 forest unit reported incorrectly as 1782 ha in Table 4.15 (should be 1772)

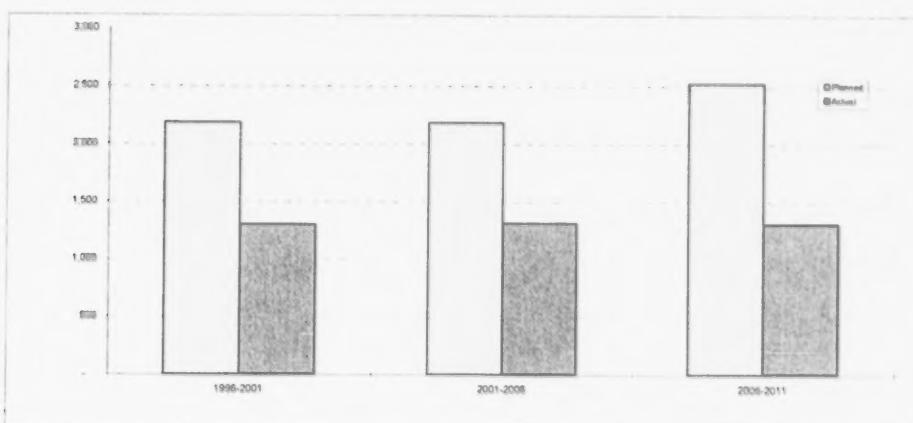


Table 5 - SUMMARY OF MANAGED PRODUCTIVE FOREST BY WORKING GROUP (TPM 4.8.2 &amp; 4.9)

MU: Mazinaw (1996-2001)

Working Group	Age Class	Protection Forest		Production Forest			
		Unavailable		Stage of Mgmt	Available		
		(ha)	(m <sup>3</sup> )		(ha)	(m <sup>3</sup> )	
Pw	B&S/NSR				2547		
	1 to 20				699		
	21 to 40				139		
	41 to 60				3781		
	61 to 80				6765		
	81 to 100				10478		
	101 to 120				1876		
	121 to 140				220		
	141 +				0		
	WG Subtotal	53	0	0	0	26505	0
Pr	B&S/NSR				117		
	1 to 20				278		
	21 to 40				149		
	41 to 60				114		
	61 to 80				263		
	81 to 100				944		
	101 to 120				65		
	121 to 140				0		
	141 +				0		
	WG Subtotal	30	0	0	0	1930	0
Pj	B&S/NSR				8		
	1 to 20				10		
	21 to 40				13		
	41 to 60				110		
	61 to 80				0		
	81 to 100				0		
	101 to 120				0		
	121 to 140				0		
	141 +				0		
	WG Subtotal	0	0	0	0	141	0
Sp	B&S/NSR				129		
	1 to 20				5		
	21 to 40				0		
	41 to 60				59		
	61 to 80				339		
	81 to 100				193		
	101 to 120				53		
	121 to 140				13		
	141 +				0		
	WG Subtotal	0	0	0	0	790	0
B	B&S/NSR				295		
	1 to 20				39		
	21 to 40				21		
	41 to 60				2117		
	61 to 80				2852		
	81 to 100				45		
	101 to 120				0		
	121 to 140				0		
	141 +				0		
	WG Subtotal	40	0	0	0	5369	0
Hc	B&S/NSR				6		
	1 to 20				6		
	21 to 40				0		
	41 to 60				260		
	61 to 80				641		
	81 to 100				2274		
	101 to 120				1949		
	121 to 140				272		
	141 +				198		
	WG Subtotal	66	0	0	0	5598	0
	Total	1883	0	0	0	0	179385
	ALL	962	0	0	0	0	44144
	B&S/NSR	0	0	0	0	0	0
	1 to 20	0	0	0	0	0	9405
	21 to 40	0	0	0	0	0	2013
	41 to 60	0	0	0	0	0	1887
	61 to 80	0	0	0	0	0	40879
	81 to 100	0	0	0	0	0	84082
	101 to 120	0	0	0	0	0	34559
	121 to 140	0	0	0	0	0	5591
	141 +	0	0	0	0	0	651
	Total	1883	0	0	0	0	179385

## Source:

TPM table 4.8.2 &amp; 4.9

MANAGEMENT UNIT NAME: Mazinaw-Lanark  
 PLAN TERM: April 1, 2001 TO March 31, 2006

**FMP-9 SUMMARY OF MANAGED CROWN PRODUCTIVE FOREST BY FOREST UNIT**

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		(ha)	(m3)	(ha)	(m3)		(ha)	(m3)
PW1	FTG- 20					Com. Thin.	1,458	7,290
	21 - 40	10	288			Com. Thin.	297	8,910
	41 - 60			71	7,455	Com. Thin.	166	17,430
	61 - 80			148	23,680	Com. Thin.	210	33,520
	61 - 80					Prep. Cut	210	33,520
	61 - 80					Seed Cut	100	16,000
	81-100	3	533	909	190,890	Prep. Cut	285	59,850
	81-100					Seed Cut	520	109,200
	81-100					First Removal	110	23,100
	81-100					Final Removal	55	3,850
	101-120			266	66,500	Prep. Cut	35	8,750
	101-120					Seed Cut	296	74,000
	101-120					First Removal	89	22,250
	101-120					Final Removal	63	4,410
	121-140					Seed Cut	23	5,980
	121-140					First Removal	38	9,880
	121-140			19	4,940	Final Removal	15	3,900
Forest Unit Subtotal		12	821	1,413	293,465		3,969	441,840
Pine1	FTG- 20			6	30	Com. Thin.	1,886	9,430
	21 - 40	7	152			Com. Thin.	706	16,238
	41 - 60	7	482	163	11,410	Com. Thin.	967	67,690
	61 - 80			1,406	168,720	Com. Thin.	3,369	404,280
	81-100					Seed Cut	5,203	832,480
	81-100	47	7,568	2,123	339,680	Final Removal	1,015	162,400
	101-120					Seed Cut	2,169	347,040
	101-120			658	105,280	Final Removal	1,449	231,840
	121-140					Seed Cut	33	5,280
	121-140			83	13,280	Final Removal	295	47,200
	141-160			2	320	Final Removal	44	7,040
	161-180					Final Removal	8	1,280
Forest Unit Subtotal		61	8,201	4,441	638,720		17,144	2,132,198
HE1	FTG- 20					Prep. Cut	65	325
	21 - 40					Prep. Cut	6	120
	41 - 60					Prep. Cut	33	1,650
	61 - 80	2	263	9	990	Prep. Cut	232	25,520
	81-100					Prep. Cut	264	39,600
	81-100	21	3,152	76	11,400	Seed Cut	233	34,950
	101-120					Prep. Cut	688	123,840
	101-120			48	8,640	Seed Cut	861	154,980
	121-140					Prep. Cut	189	34,020
	121-140	9	1,573	19	3,420	Seed Cut	285	51,300
	141-160					Prep. Cut	58	10,440
	141-160					Seed Cut	87	15,660
	181-200					First Removal	13	2,340
	181-200						4	720
Forest Unit Subtotal		32	4,988	154	24,810		3,018	495,465

MANAGEMENT UNIT NAME: Mazinaw-Lanark  
 PLAN TERM: April 1, 2001 TO March 31, 2006

FMP-9 SUMMARY OF MANAGED CROWN PRODUCTIVE FOREST BY FOREST UNIT

Forest Unit	Age Class	Protection Forest		Production Forest				
		(ha)	(m3)	Unavailable		Stage of Management	Available	
				(ha)	(m3)		(ha)	(m3)
OR1	FTG- 20			166	232	Com. Thin.	2,072	4,144
	41 - 60	33	1,658	288	10,080	Com. Thin.	220	11,000
	61 - 80					Seed Cut	3,086	277,740
	61 - 80	307	27,646	4,024	253,512	First Removal	1,089	98,010
	81 - 100					Seed Cut	2,773	360,490
	81 - 100					First Removal	6,546	850,980
	81 - 100	468	60,791	15,645	1,423,695	Final Removal	425	55,250
	101-120					Seed Cut	127	20,320
	101-120					First Removal	1,223	195,680
	101-120	36	5,696	522	58,464	Final Removal	219	35,040
	121-140					First Removal	28	4,480
	121-140			17	1,904	Final Removal	7	1,120
Forest Unit Subtotal		844	95,791	20,662	1,747,887		17,815	1,914,254
LH1	All	29	1,405	36	1,775		734	36,186
	Forest Unit Subtotal	29	1,405	36	1,775		734	36,186
LC1	FTG- 20			8	12		331	497
	21 - 40			2	4		3	6
	41 - 60			10	80		32	256
	61 - 80	3	121	60	2,100		517	18,095
	81 - 100	5	311	118	7,080		2,369	142,140
	101-120			28	2,100		802	60,150
	121-140			3	195		71	4,615
	141-160						20	1,300
	161-180	7	461				8	520
	181-200						22	1,430
	Forest Unit Subtotal	16	894	229	11,571		4,175	229,009
HD1	All	22	3,225	1,277	191,550		19,765	2,964,750
	Forest Unit Subtotal	22	3,225	1,277	191,550		19,765	2,964,750
HD2	All	19	1,451	2,004	150,300		18,562	1,392,150
	Forest Unit Subtotal	19	1,451	2,004	150,300		18,562	1,392,150
HD4	FTG- 20	40	121			Com. Thin.	906	2,718
	21 - 40					Com. Thin.	20	300
	41 - 60	5	328	88	5,280	Com. Thin.	282	16,920
	61 - 80					Seed Cut	1,179	117,900
	61 - 80	53	5,264	325	32,500	First Removal	618	61,800
	81 - 100					Seed Cut	384	53,760
	81 - 100	45	6,286	405	56,700	First Removal	671	93,940
	101-120					Seed Cut	43	6,020
	101-120					First Removal	160	22,400
	101-120	23	3,245	40	5,600	Final Removal	9	1,260
	121-140					Seed Cut	8	1,120
	121-140					First Removal	76	10,640
	121-140					Final Removal	5	700
	141-160					First Removal	14	1,680
	141-160	28	3,346			Final Removal	2	240
	161-180					First Removal	30	3,600
	161-180					Final Removal	3	360
Forest Unit Subtotal		194	18,589	858	100,080		4,410	395,358

MANAGEMENT UNIT NAME: Mazinaw-Lanark  
 PLAN TERM: April 1, 2001 TO March 31, 2006

**FMP-9 SUMMARY OF MANAGED CROWN PRODUCTIVE FOREST BY FOREST UNIT**

Forest Unit	Age Class	Protection Forest		Production Forest				
		(ha)	(m3)	Unavailable		Stage of Management	Available	
				(ha)	(m3)		(ha)	(m3)
CM1	FTG- 20			27	81		394	1,182
	21 - 40			2	24		77	924
	41 - 60			19	665		212	7,420
	61 - 80	2	111	180	12,600		2,323	162,610
	81 - 100			63	5,670		995	89,550
	101-120						279	27,900
	121-140			2	170		16	1,360
	141-160						12	1,020
Forest Unit Subtotal		2	111	293	19,210		4,308	291,966
INT	FTG- 20	99	397	48	192		2,549	10,196
	21 - 40						468	9,360
	41 - 60	9	586	429	27,885		966	62,790
	61 - 80	235	23,931	3,827	390,354		9,159	934,218
	81 - 100	92	11,010	801	96,120		3,853	462,360
	101-120			184	22,080		333	39,960
Forest Unit Subtotal		435	35,925	5,289	536,631		17,328	1,518,884
MW2	21 - 40					Com. Thin.	31	465
	41 - 60			1,001	60,060	Com. Thin.	685	41,100
	61 - 80					Seed Cut	1,248	124,800
	61 - 80	33	3,267	3,093	309,300	First Removal	1,726	172,600
	61 - 80					Final Removal	648	64,000
	81 - 100					Seed Cut	429	60,060
	81 - 100	20	2,769	808	113,120	First Removal	1,288	180,320
	81 - 100					Final Removal	429	60,060
	101-120					Seed Cut	69	9,660
	101-120					First Removal	302	42,280
	101-120			33	4,620	Final Removal	93	13,020
	121-140					Seed Cut	10	1,400
	121-140					First Removal	55	7,700
	121-140			10	1,400	Final Removal	19	2,560
	141-160					First Removal	1	130
Forest Unit Subtotal		52	6,036	4,945	488,500		7,033	781,055
MW1	FTG- 20						692	2,076
	21 - 40						41	1,230
	41 - 60			1,325	92,750		1,044	73,080
	61 - 80	169	18	4,256	468,160		8,716	958,760
	81 - 100			817	122,550		3,470	520,500
	101-120			1	150		362	54,300
	121-140			14	2,100		7	0
	181-200							770
Forest Unit Subtotal		186	0	6,413	685,710		14,332	1,610,716

MANAGEMENT UNIT NAME: Mazinaw-Lanark  
 PLAN TERM: April 1, 2001 TO March 31, 2006

FMP-9 SUMMARY OF MANAGED CROWN PRODUCTIVE FOREST BY FOREST UNIT

Forest Unit	Age Class	Protection Forest		Production Forest				
		(ha)	(m3)	Unavailable		Stage of Management	Available	
				(ha)	(m3)		(ha)	(m3)
ALL	FTG-20	140	518	255	547		10,353	37,858
	21-40	16	440	4	28		1,649	37,553
	41-60	55	3,054	3,394	215,665		4,607	299,336
	61-80	803	60,604	17,328	1,661,916		34,429	3,504,173
	81-100	718	92,420	21,765	2,366,905		31,317	4,194,840
	101-120	59	8,941	1,780	273,434		9,671	1,495,100
	121-140	9	1,573	167	27,409		1,173	193,355
	141-160	28	3,346	2	320		238	37,510
	161-180	7	461	0	0		49	5,760
	181-200	0	0	0	0		46	5,260
	201-220	0	0	2	360		0	0
	All	69	6,081	3,317	343,625		39,061	4,393,086
	Total for all FUs	1,903	177,437	48,014	4,890,209		132,593	14,203,831
<b>Grand Total</b>		<b>1,903</b>	<b>177,437</b>	<b>48,014</b>	<b>4,890,209</b>		<b>132,593</b>	<b>14,203,831</b>

**FMP-9**

**SUMMARY OF MANAGED CROWN PRODUCTIVE FOREST BY FOREST UNIT**

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Mgmt	Available	
		(ha)	(m3)	(ha)	(m3)		(ha)	(m3)
CM1	1-20	0	97	0	130	0		
	21-40	5	61	14	195	141	1,900	
	41-60	25	1,471	251	14,926	1,083	64,414	
	61-80	13	1,450	349	38,892	1,248	139,147	
	81-100	7	1,056	218	31,687	743	108,070	
	101-120	4	627	58	9,438	445	71,903	
	121-140		0	15	1,905	182	23,610	
	141-160		0	36	4,174	7	853	
	161+	0	0	0	2		207	
	<b>FU Subtotal</b>	<b>53</b>	<b>4,665</b>	<b>1,039</b>	<b>101,217</b>	<b>3,981</b>	<b>410,103</b>	
HD1	<b>FU Subtotal</b>	<b>12</b>	<b>511</b>	<b>4,082</b>	<b>347,501</b>	<b>Selection</b>	<b>25,056</b>	<b>2,133,017</b>
HD2	<b>FU Subtotal</b>	<b>35</b>	<b>1,147</b>	<b>3,287</b>	<b>215,441</b>	<b>Selection</b>	<b>16,368</b>	<b>1,072,812</b>
HD4	1-20	0	73	0	313	0		
	21-40	10	64	10	63	145	941	
	41-60	52	1,572	691	21,068	ComThin	1,079	32,897
	61-80	78	4,541	2,804	164,008	Seed Cut	5,180	303,030
	81-100		1,700	502	40,404	Seed Cut	1,413	113,747
	101-120		0	141	12,754	1st Rem.	471	42,626
	121-140		0	61	5,337	Final Rem.	147	12,789
	141-160		0	0	0	Final Rem.	26	1,927
	161+	0	8	523	Final Rem.	0		
	<b>FU Subtotal</b>	<b>160</b>	<b>7,876</b>	<b>4,290</b>	<b>244,157</b>	<b>8,774</b>	<b>507,957</b>	
HE1	1-20	0	0	0	3	0		
	21-40		0	7	14	0		
	41-60		0	32	1,383	26	1,118	
	61-80	6	853	51	5,296	178	18,554	
	81-100		0	69	10,849	PrepCut	415	65,001
	101-120	2	331	22	4,083	Seed Cut	457	85,861
	121-140		0	52	10,125	1st Rem.	524	102,489
	141-160		0	11	2,083	Final Rem.	98	18,859
	161+	0	0	0	0	Final Rem.	90	16,964
	<b>FU Subtotal</b>	<b>8</b>	<b>984</b>	<b>243</b>	<b>33,834</b>	<b>1,791</b>	<b>308,845</b>	
INT	1-20	9	37	232	928	1,073	4,291	
	21-40	15	675	16	731	1,219	54,253	
	41-60	77	7,887	545	55,604	1,283	130,866	
	61-80	63	9,186	2,073	300,530	4,377	634,716	
	81-100	3	412	698	111,284	3,243	517,272	
	101-120		0	37	5,735	163	25,069	
	121-140		0	0	0	4	588	
	141-160		0	0	0	0	0	
	161+	0	0	0	0			
	<b>FU Subtotal</b>	<b>168</b>	<b>18,197</b>	<b>3,601</b>	<b>474,812</b>	<b>11,363</b>	<b>1,367,056</b>	
LC1	1-20	0	59	0	133	0		
	21-40	0	21	126	57	345		
	41-60	6	191	62	1,904	284	8,662	
	61-80	29	1,999	165	11,487	794	55,195	
	81-100	25	2,512	310	31,670	1,679	171,267	
	101-120	12	1,415	119	14,061	793	93,969	
	121-140		0	8	890	241	26,242	
	141-160	6	585	4	354	25	2,412	
	161+	7	651	0	0	35	3,148	
	<b>FU Subtotal</b>	<b>85</b>	<b>7,354</b>	<b>748</b>	<b>60,472</b>	<b>4,041</b>	<b>361,239</b>	
LH1	<b>FU Subtotal</b>	<b>203</b>	<b>5,584</b>	<b>379</b>	<b>20,851</b>	<b>Selection</b>	<b>1,866</b>	<b>102,658</b>
MW1	1-20	0	358	0	1,200	0		
	21-40	32	614	208	3,955	794	15,081	
	41-60	104	7,283	1,630	114,104	3,984	278,880	
	61-80	232	29,410	3,854	489,482	6,357	807,339	
	81-100	18	2,958	1,423	234,765	2,834	467,571	
	101-120	2	364	66	11,909	399	72,257	
	121-140		0	21	2,930	73	10,271	
	141-160		0	0	0	0	0	
	161+	0	0	0	0	6	679	
	<b>FU Subtotal</b>	<b>388</b>	<b>40,628</b>	<b>7,560</b>	<b>857,145</b>	<b>15,646</b>	<b>1,652,078</b>	
MW2	1-20	0	0	0	46	0		
	21-40	44	463	61	642	88	920	

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Mgmt	Available	
		(ha)	(m3)	(ha)	(m3)		(ha)	(m3)
	41-60	225	13,281	2,511	148,127	ComThin	1,854	109,372
	61-80	470	53,360	5,222	592,671	Seed Cut	4,359	494,803
	81-100	14	2,301	2,703	431,152	Seed Cut	3,321	529,700
	101-120		0	77	14,121	1st Rem.	1,106	202,898
	121-140		0	63	10,848	Final Rem.	285	48,853
	141-160		0		0	Final Rem.	1	139
	161+		0	0	0		0	0
	<b>FU Subtotal</b>	<b>754</b>	<b>69,404</b>	<b>10,637</b>	<b>1,197,561</b>		<b>11,060</b>	<b>1,386,685</b>
OR1	1-20		0	125	0		241	0
	21-40		0	18	71		27	109
	41-60	128	6,414	454	22,702	ComThin	196	9,778
	61-80	285	32,481	3,540	403,577	ComThin	2,489	283,785
	81-100	120	20,287	5,098	859,017	Seed Cut	7,203	1,213,697
	101-120	1	256	268	54,324	1st Rem.	1,296	262,425
	121-140		0		0	Final Rem.	107	22,323
	141-160		0	0	0		0	0
	161+		0	0	0		0	0
	<b>FU Subtotal</b>	<b>535</b>	<b>59,438</b>	<b>9,503</b>	<b>1,339,691</b>		<b>11,559</b>	<b>1,792,117</b>
PINE1	1-20		0	116	870		362	2,717
	21-40		0	39	1,977	ComThin	553	27,942
	41-60	25	2,582	1,003	103,345	ComThin	1,256	129,401
	61-80	56	8,304	2,493	370,234	ComThin	3,470	515,251
	81-100	65	11,699	2,970	536,005	Seed Cut	5,708	1,030,327
	101-120	33	6,747	724	147,391	Final Rem.	3,960	805,799
	121-140		0	279	61,062	Final Rem.	1,097	240,209
	141-160		0	6	1,419	Final Rem.	22	4,961
	161+		0	0	0	Final Rem.	3	605
	<b>FU Subtotal</b>	<b>179</b>	<b>29,333</b>	<b>7,631</b>	<b>1,222,302</b>		<b>16,431</b>	<b>2,757,209</b>
PW1	1-20		0	0	0		59	588
	21-40		0	12	786	ComThin	107	6,778
	41-60		0	338	43,114	ComThin	433	55,224
	61-80	10	1,831	734	132,941	PrepCut	1,254	227,062
	81-100	1	289	900	201,645	Seed Cut	1,517	339,766
	101-120		0	180	45,251	1st Rem.	482	121,560
	121-140		0	33	8,926	Final Rem.	188	50,948
	141-160		0		0	Final Rem.	33	9,422
	161+		0	0	0		0	0
	<b>FU Subtotal</b>	<b>11</b>	<b>2,119</b>	<b>2,198</b>	<b>432,663</b>		<b>4,073</b>	<b>811,346</b>
ALL	1-20	9	37	1,061	1,798		3,561	7,596
	21-40	106	1,877	407	8,560		3,131	108,268
	41-60	642	40,682	7,517	526,276		11,477	820,611
	61-80	1,242	143,215	21,284	2,509,098		29,707	3,478,881
	81-100	274	43,213	14,891	2,488,480		28,076	4,556,417
	101-120	54	9,740	1,692	319,067		9,572	1,784,365
	121-140	0	0	532	102,024		2,848	538,321
	141-160	6	585	57	8,029		213	38,572
	161+	7	651	8	523		135	21,603
	ALL	250	7,242	7,748	583,792		43,290	3,308,487
	<b>FU Subtotal</b>	<b>2,591</b>	<b>247,241</b>	<b>55,198</b>	<b>6,547,647</b>		<b>132,009</b>	<b>14,663,123</b>
	<b>Grand Total</b>	<b>2,591</b>	<b>247,241</b>	<b>55,198</b>	<b>6,547,647</b>		<b>132,009</b>	<b>14,663,123</b>

**2009 Independent Forest Audit**

**Table 6 - SUMMARY REPORT OF RENEWAL, TENDING AND PROTECTION OPERATIONS**

MU: Mazinaw (1996-2001) and Mazinaw-Lanark (2001-2011)

Area is Annualized for the indicated period	Area Summary of all Forest Units (ha)						3-term average [%]	
	1996-2001		2001-2006		2006-2011			
	Planned	Actual	Planned	Actual	Planned	*Actual		
<b>Renewal</b>								
Regeneration	0.0	0.0		0.0		0.0		
Uneven-Aged Management	0.0	0.0		0.0		0.0		
Selection Cut - Harvest	849.4	696.2	931.0	617.0	1,144.9	493.5		
Total Uneven-Aged Management	849.4	696.2	931.0	617.0	1,144.9	493.5	62%	
Even-Aged Management	0.0	0.0		0.0		0.0		
Natural Regeneration	0.0	0.0		0.0		0.0		
Clearcut	438.6	262.2	220.8	28.6	0.0	18.1		
Strip Cut	63.0	0.0	0.4	0.0	0.0	0.0		
Seed Tree Cut	0.0	0.0		58.4	305.8	117.5		
Uniform Shelterwood Seed Cut	344.6	357.8	267.2	387.0	287.9	272.5		
Subtotal Natural	846.2	620.0	488.6	474.0	593.7	408.5	78%	
Artificial Regeneration	0.0	0.0		0.0		0.0		
Planting	228.6	108.4	264.2	124.2	352.1	131.0	43%	
Seeding	0.0	0.0		0.0		0.0		
direct	0.0	0.0		0.0		0.0		
with site preparation	0.0	0.0		0.0		0.0		
Scarification	170.2	0.0	91.0	0.0	91.4	34.5	10%	
Subtotal Artificial	398.8	108.4	355.2	124.2	443.5	165.5	33%	
Total Even-Aged Management	1,245.0	728.4	943.8	598.2	1,037.2	574.0	61%	
Total Regeneration	2,094.4	1,424.6	1,774.8	1,215.2	2,182.1	1,067.5	61%	
<b>Site Preparation</b>								
Mechanical	0.0	0.0		0.0		0.0		
Enhanced	177.0	103.8	264.2	167.0	309.1	84.5	47%	
Chemical	0.0	0.0		120.4	0.0	0.0		
Prescribed Burn	4.0	0.0	28.2	8.8	32.4	0.0	14%	
49.6	0.0	0.0	0.0	33.4	0.0	0.0		
Total Site Preparation	230.6	103.8	292.4	296.2	375.0	84.5	54%	
<b>Tending</b>								
Cleaning	0.0	0.0		0.0		0.0		
manual	252.6	134.4	140.6	181.4	398.2	121.0	55%	
chemical - ground	0.0	0.0	75.0	30.6	48.5	0.0	25%	
-aerial	0.0	0.0		0.0		0.0		
mechanical	0.0	0.0		0.0		0.0		
prescribed burn	0.0	0.0		0.0		0.0		
Spacing, pre-commercial thinning, improvement cutting	0.0	0.0		0.0		0.0		
even-aged	383.0	129.0	180.0	40.4	354.7	94.5	29%	
uneven-aged	849.4	297.2	514.8	182.8	568.4	235.0	37%	
Cultivation	0.0	0.0		0.0		0.0		
Pruning	0.0	0.0		2.8	0.0	0.0		
Total Tending	1,485.0	560.6	910.4	438.0	1,401.9	450.5	38%	
<b>Protection (Insect Pest Control)</b>								
accelerated harvest								
salvage					15.9			
manual protection								
ground insecticide								
aerial insecticide								
Total Protection					15.9		0.0	
Source:	TMP 4 19 (1996-2001)	RPFO-7 (1996-2001)	FMP-25 (2001-2006)	10 YR AR-7 (2001-2006)	FMP-25 (2006-2011)	AR-7 (2007-2008)		

\* 2006-2011 actual areas are annualized from 2 years of reporting (i.e. 2006-2008)

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Table 7 - Harvested Area Successfully Regenerated - Summary of All Forest Units

MU: Mazinaw (1995-2001)

	AREA IN HECTARES (All Forest Units Combined)	AREA IN HECTARES (All Forest Units Combined)	Entire area of Even-aged harvest** [ha]
	Even-aged Management	Uneven-aged Management	
Total Area Harvested (assessable harvest*)	3,323	3,018	
Total Area Surveyed for Regeneration Success	1,400	1,856	
Total Unsurveyed Area	1,923	1,162	
Total Area Declared Successfully Regenerated	753	1,680	
Total Area Surveyed Not Successfully Regenerated	647	176	
NSR	-	-	
B&S	-	-	
Not Available for Regen. (e.g. Roads & landings)	-	-	
Other	-	-	
Percent of Area Surveyed Declared Successfully Regenerated	53.8%	90.5%	

Source: AWR 1995-96, RPFO-1 (1996-2001) actual survey results from 2002-2008

\* Assessable harvest includes all selection, all clearcut and shelterwood SE ED CUT

\*\* All even-aged harvest, including assessable.

